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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

August 2003

Data Assimilation
Meteorological Office
London Rd
Bracknell
Berkshire
RG12 2SZ

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE							
CG2556	P	21	19	24	1.3	-10.7	10.8
CG2992	P	21	81	100	0.9	-13.6	13.6
C6SI4	P	24	0	0	1.6	6.1	6.3
DFHA	P	33	0	42	1.0	4.0	4.2
KMJL	P	23	0	0	0.7	-4.2	4.3
OWTW2	P	28	0	39	6.2	3.5	7.1
OYYK2	P	24	0	0	1.0	5.7	5.8
P3NK5	P	23	0	96	2.0	8.0	8.3
S6HU8	P	27	0	4	1.4	4.3	4.6
TEST	P	465	6	83	3.7	-6.5	7.5
UCJB	P	41	0	5	1.1	-5.1	5.2
UCJL	P	29	3	7	2.0	4.2	4.6
UCUE	P	22	32	50	5.9	1.7	6.1
UIAG	P	25	4	80	5.3	-5.4	7.6
VVGG	P	24	0	4	1.1	4.6	4.8
V7EM6	P	20	0	70	0.9	4.0	4.1
WCV8696	P	21	0	76	1.1	-5.6	5.7
WDJK	P	23	0	0	0.9	-4.0	4.1
WUW2120	P	35	86	97	3.9	-6.5	7.6
XPYM	P	101	0	0	0.6	4.4	4.5
ZCBD2	P	24	0	100	0.9	10.6	10.6
31056	P	1689	13	78	5.2	-4.0	6.6
62166	P	58	0	100	4.0	4.5	6.0
WIND SPEED							
C6IM2	SPEED	50	0	14	2.9	5.9	6.6
C6T2064	SPEED	20	0	10	2.0	5.8	6.1
DHLP	SPEED	30	0	13	6.2	5.0	8.0
ELTY4	SPEED	25	0	100	4.8	8.3	9.6
ELXD5	SPEED	21	0	33	5.3	5.2	7.4
FNNB	SPEED	64	0	50	3.7	7.9	8.7
SHJC	SPEED	38	0	5	3.0	5.1	6.0
VRWK3	SPEED	51	0	100	3.2	5.2	6.1
3ETX6	SPEED	71	25	100	6.8	8.7	11.1
WIND DIRECTION							
ELWA2	DIRN.	24	0	0	44.0	38.2	58.3
KS025	DIRN.	26	0	0	60.3	-41.5	73.2
23168	DIRN.	116	0	0	19.0	98.6	100.4
3ETX6	DIRN.	45	40	0	95.0	-13.3	95.9
SEA SURFACE TEMPERATURE							
A8BZ6	SST	31	6	48	1.4	-3.4	3.7
CFD3659	SST	26	42	92	2.2	7.1	7.4
CGJK	SST	277	6	47	2.6	3.9	4.6
CGTF	SST	59	14	75	2.4	3.6	4.4
CG2350	SST	209	25	100	1.5	0.9	1.8
CG2522	SST	560	100	100			
CG2960	SST	187	45	100	2.0	2.0	2.8
CG2992	SST	30	100	100			
CYGR	SST	25	28	36	2.9	0.5	2.9
DBBX	SST	326	31	100	0.9	0.7	1.1
DBBXX	SST	51	33	100	0.8	0.7	1.1
DEDI	SST	394	43	44	1.2	0.4	1.2
DHDH	SST	21	5	5	0.6	-3.1	3.2
EIQN	SST	611	60	100	0.9	0.4	1.0
ELSM9	SST	34	0	100	0.8	-6.2	6.2
ELUO5	SST	39	0	38	1.0	-3.7	3.8
ELVZ6	SST	39	0	49	3.0	3.1	4.3
ELWY3	SST	30	0	100	0.9	3.0	3.1

FNJI	SST	110	0	100	0.6	3.7	3.7
FNYF	SST	35	0	83	1.9	4.8	5.1
KCB53	SST	24	0	50	2.4	3.1	3.9
KRPB	SST	48	0	100	1.8	-6.0	6.3
KS025	SST	154	42	100	1.3	0.2	1.4
P3NK5	SST	20	30	65	4.1	-4.0	5.7
TEST	SST	431	100	100			
TOUR	SST	108	3	100	0.5	7.8	7.9
TSLN	SST	158	0	47	1.8	-4.1	4.4
TSMS	SST	65	0	100	0.7	-4.2	4.3
UCBM	SST	34	0	100	2.0	-4.1	4.6
UCDM	SST	24	13	67	1.8	-4.7	5.0
UCEF	SST	28	0	71	1.4	-4.9	5.1
UCJB	SST	38	0	39	1.6	-3.5	3.9
UCOY	SST	37	0	38	2.1	3.4	4.0
UFHZ	SST	26	0	50	3.0	-4.0	5.0
UFSZ	SST	50	0	100	0.3	-6.3	6.3
VGPY	SST	25	28	32	1.8	0.1	1.8
VRXR5	SST	25	0	100	0.5	5.5	5.6
V7DN3	SST	49	0	100	1.6	-3.5	3.8
V7DP7	SST	26	4	100	2.2	-4.3	4.8
WDCJ	SST	42	0	48	3.1	3.4	4.6
WN4201	SST	45	80	80	1.0	-1.5	1.8
WQZ9670	SST	73	12	62	3.0	-4.2	5.1
WRZU	SST	29	0	62	1.3	-4.3	4.5
WWU8	SST	28	96	100	0.0	0.6	0.6
YJQL3	SST	30	0	100	0.9	-4.3	4.4
ZCBH9	SST	48	52	54	1.7	-1.1	2.0
3FJV4	SST	35	0	0	0.9	3.1	3.3
31056	SST	395	54	54	0.3	0.5	0.6
44018	SST	645	8	71	2.3	-4.3	4.9
44034	SST	613	0	75	1.2	-4.0	4.2
44036	SST	374	0	49	0.7	-3.1	3.1
44258	SST	627	0	56	2.1	-3.8	4.3
45006	SST	216	0	98	1.3	5.7	5.9
45136	SST	598	0	66	1.7	3.3	3.8
45140	SST	598	100	100			
45141	SST	389	100	100			
45144	SST	636	100	100			
45145	SST	617	100	100			
45147	SST	639	100	100			
45148	SST	623	100	100			
45150	SST	634	100	100			
45152	SST	457	100	100			
46063	SST	216	0	58	1.6	-3.0	3.4
46131	SST	634	100	100			
46146	SST	635	100	100			
46181	SST	617	100	100			
9KKS	SST	29	0	21	1.4	-3.5	3.7
9MTS	SST	24	25	25	0.6	-0.2	0.7

Figure 1. SHIP/SYNOP mean daily count. AUGUST 2003
All hours
Global average number of observations in 24 hours = 19613

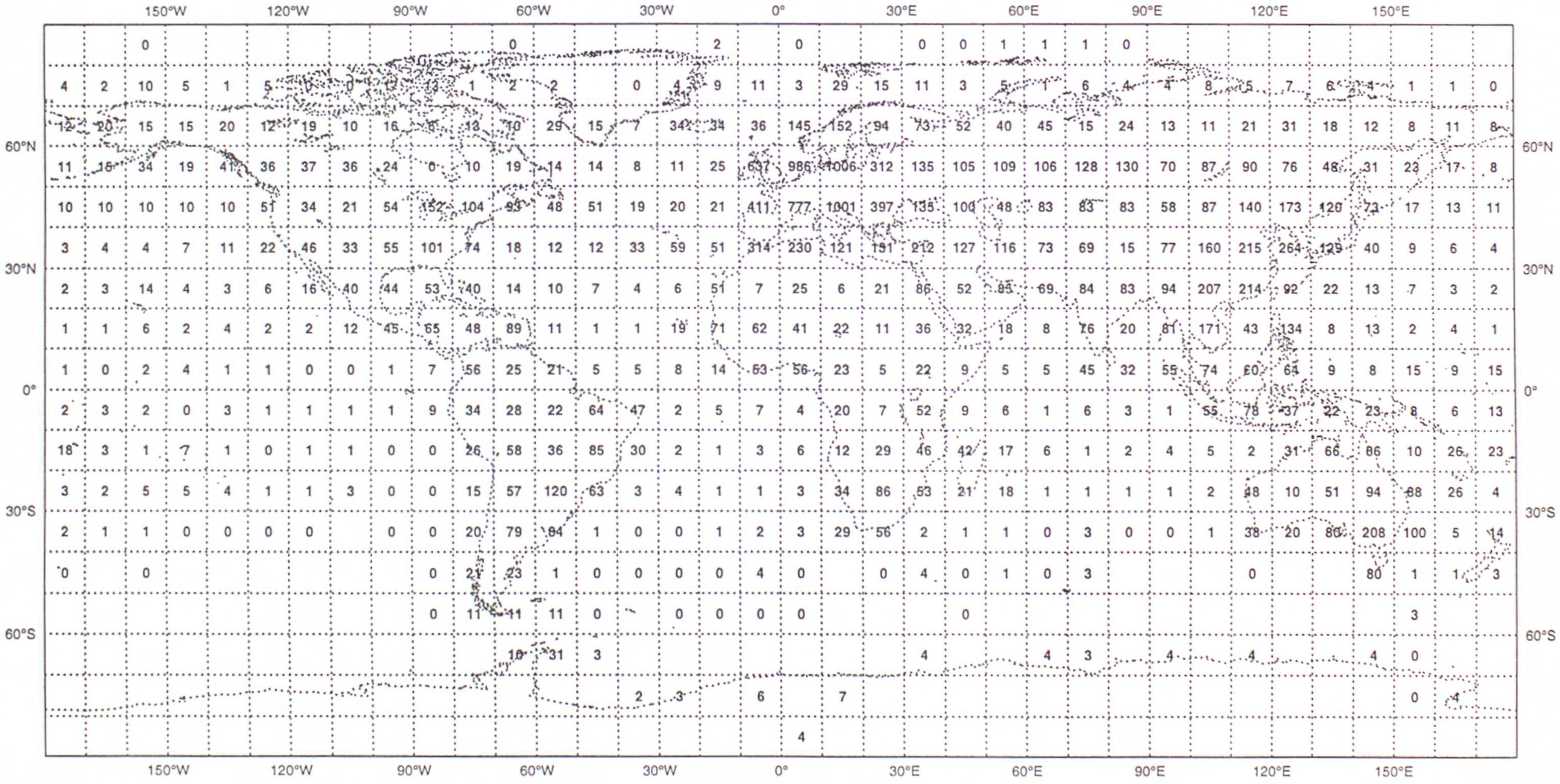

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 2 0 0 0 1 1 1 0
4 2 10 5 1 5 0 1 2 2 0 4 9 11 3 29 15 11 3 5 1 6 4 4 8 5 7 6 4 1 1 0
12 20 15 15 20 12 19 10 16 8 13 10 29 15 7 34 34 36 145 152 94 73 52 40 45 15 24 13 11 21 31 18 12 8 11 8
11 16 34 19 41 36 37 36 24 0 10 19 14 14 8 11 25 637 986 1006 312 135 105 109 106 128 130 70 87 90 76 48 31 23 17 8
10 10 10 10 10 51 34 21 54 152 104 93 48 51 19 20 21 411 777 1001 397 135 100 48 83 83 83 58 87 140 173 120 73 17 13 11
3 4 4 7 11 22 46 33 55 101 74 18 12 12 33 59 51 314 230 121 191 212 127 116 73 69 15 77 160 215 264 129 40 9 6 4
2 3 14 4 3 6 16 40 44 53 140 14 10 7 4 6 51 7 25 6 21 86 52 85 69 84 83 94 207 214 92 22 13 7 3 2
1 1 6 2 4 2 2 12 45 65 48 89 11 1 1 19 71 62 41 22 11 36 32 18 8 76 20 81 171 43 134 8 13 2 4 1
1 0 2 4 1 1 0 0 1 7 56 25 21 5 5 8 14 63 56 23 5 22 9 5 5 45 32 55 74 60 64 9 8 15 9 15
2 3 2 0 3 1 1 1 1 9 34 28 22 64 47 2 5 7 4 20 7 52 9 6 1 6 3 1 55 78 37 22 23 8 6 13
18 3 1 7 1 0 1 1 0 0 26 58 36 85 30 2 1 3 6 12 29 46 42 17 6 1 2 4 5 2 31 66 86 10 26 23
3 2 5 5 4 1 1 3 0 0 15 57 120 63 3 4 1 1 3 34 86 53 21 18 1 1 1 1 2 48 10 51 94 88 26 4
2 1 1 0 0 0 0 0 0 20 79 84 1 0 0 1 2 3 29 56 2 1 1 0 3 0 0 1 38 20 80 208 100 5 14
0 0 0 21 23 1 0 0 0 0 4 0 0 4 0 1 0 3 0 80 1 1 3
0 11 11 11 0 0 0 0 0 0 3
10 31 3 4 4 3 4 4 4 0
2 3 6 7 0 4
4

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoys.
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		: All hours
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	: Percentage of observations flagged excluding those with gross errors
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
	:25 m s^{-1}	(vector wind)
	:10 degrees	(sea surface temperature)

SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
SEA LEVEL PRESSURE									
16559	-41.7	87.1	P	141	100	100			
17567	-57.5	30.9	P	678	26	52	6.4	-0.9	6.4
21906	40.4	158.6	P	36	72	97	0.5	0.5	0.7
21907	40.5	143.2	P	81	100	100			
21909	44.2	158.9	P	66	32	91	0.8	-1.0	1.3
23505	14.0	71.8	P	239	44	76	6.5	-4.8	8.1
33600	-46.1	-54.5	P	619	2	100	4.0	4.2	5.8
41505	16.1	-53.0	P	512	0	100	0.5	-9.4	9.5
41649	16.3	-61.1	P	80	0	100	0.3	-5.5	5.5
44741	39.0	-69.9	P	294	32	36	2.4	1.3	2.7
46512	53.8	-151.7	P	65	100	100			
48585	81.6	-113.7	P	367	26	91	7.2	2.1	7.5
55609	-52.9	-166.0	P	233	82	82	1.2	0.2	1.2
WIND DIRECTION									
13602	18.8	-30.0	DIRN.	324	0	0	12.1	36.0	38.0
41537	28.5	-59.3	DIRN.	182	1	0	10.3	-38.2	39.5
SEA SURFACE TEMPERATURE									
13607	27.8	-15.5	SST	144	1	72	2.0	3.5	4.0
14918	-8.5	68.6	SST	87	100	100			
23903	-33.1	18.0	SST	62	16	79	3.9	-3.2	5.1
33502	-29.5	-14.6	SST	130	6	100	0.5	3.2	3.3
41651	27.2	-67.7	SST	512	4	100	0.3	-4.1	4.1
44507	44.1	-41.3	SST	103	57	100	1.6	-7.3	7.5
46512	53.8	-151.7	SST	105	35	98	5.6	-3.1	6.4
46972	18.2	-158.6	SST	219	6	100	0.2	4.5	4.5
51518	-10.7	150.2	SST	93	6	89	2.4	-7.7	8.1
51727	-14.4	171.3	SST	48	38	100	2.8	-4.1	5.0
51768	-14.0	168.3	SST	134	4	100	1.4	-5.9	6.1
56513	-25.3	46.0	SST	206	10	78	5.0	-1.8	5.3

Figure 2. DRIFTER mean daily count. AUGUST 2003
All hours
Global average number of observations in 24 hours = 10984

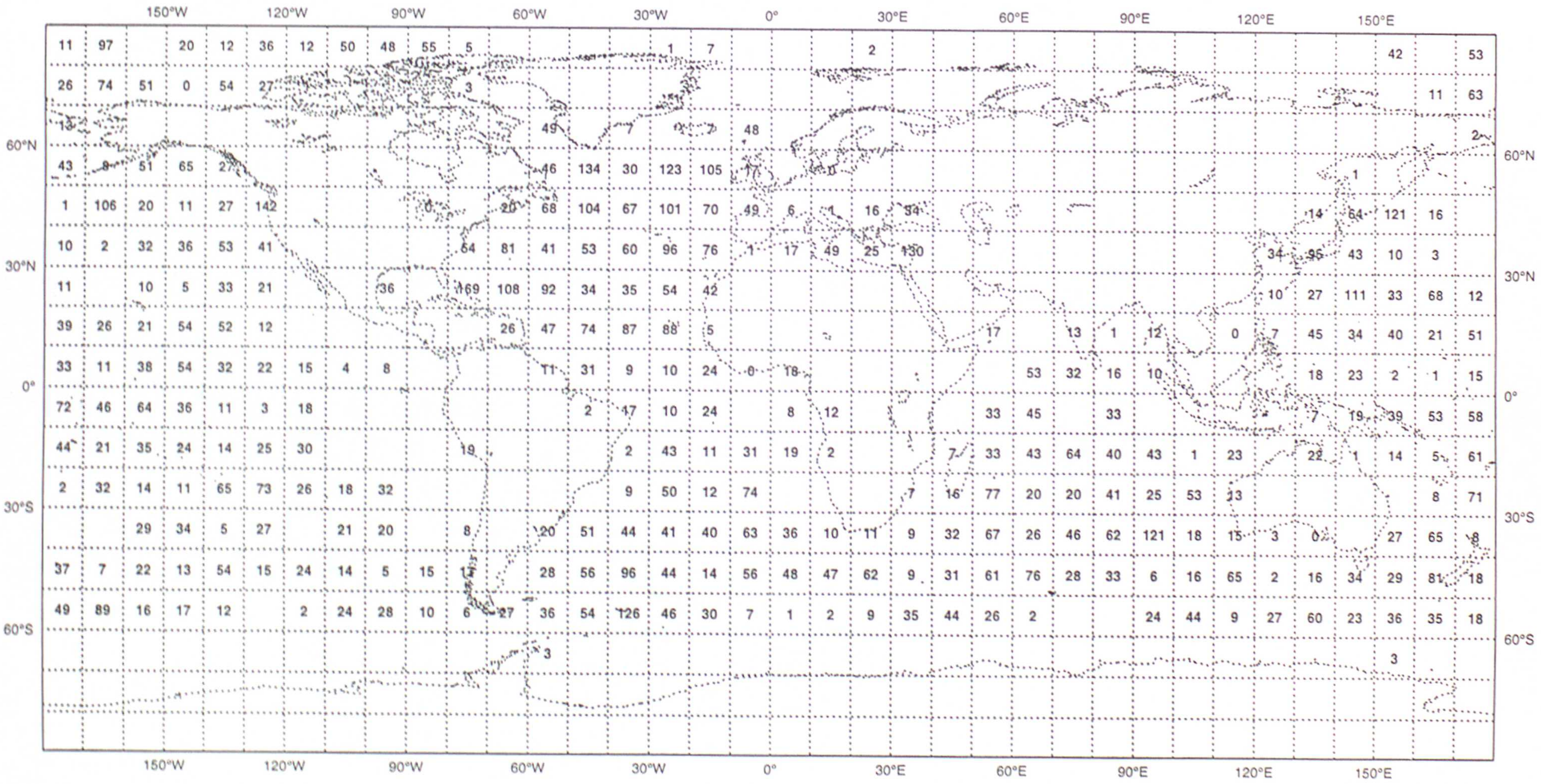

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
11 97 20 12 36 12 50 48 55 5 1 7 2 42 53
26 74 51 0 54 27 3 11 63
13 49 7 7 48 2
43 8 51 65 27 46 134 30 123 105 17 0 1
1 106 20 11 27 142 0 20 68 104 67 101 70 49 6 1 16 34 14 64 121 16
10 2 32 36 53 41 64 81 41 53 60 96 76 1 17 49 25 130 34 95 43 10 3
11 10 5 33 21 36 169 108 92 34 35 54 42 10 27 111 33 68 12
39 26 21 54 52 12 26 47 74 87 88 5 17 13 1 12 0 7 45 34 40 21 51
33 11 38 54 32 22 15 4 8 11 31 9 10 24 0 18 53 32 16 10 18 23 2 1 15
72 46 64 36 11 3 18 2 17 10 24 8 12 33 45 33 7 19 39 53 58
44 21 35 24 14 25 30 19 2 43 11 31 19 2 7 33 43 64 40 43 1 23 22 1 14 5 61
2 32 14 11 65 73 26 18 32 9 50 12 74 7 16 77 20 20 41 25 53 13 8 71
29 34 5 27 21 20 8 20 51 44 41 40 63 36 10 11 9 32 67 26 46 62 121 18 15 3 0 27 65 8
37 7 22 13 54 15 24 14 5 15 17 28 56 96 44 14 56 48 47 62 9 31 61 76 28 33 6 16 65 2 16 34 29 81 18
49 89 16 17 12 2 24 28 10 6 27 36 54 126 46 30 7 1 2 9 35 44 26 2 24 44 9 27 60 23 36 35 18
3 3

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION AUG 200

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	57	0	0	96	2.1	-7.8	8.1
60728	36.4N	10.7E	1	MS	41	0	0	0	0.6	-8.2	8.2
62056	32.8N	21.8E	625	S8	69	1	1	59	1.3	-4.8	5.0
62790	12.1N	24.9E	674	MS	49	3	6	2	1.7	4.2	4.5
63801	4.9S	29.6E	882	S8	99	4	4	3	0.8	7.4	7.4
63881	8.0S	31.6E	1923	S	43	0	0	0	0.6	12.9	12.9
64654	8.4N	20.6E	510	MS	24	0	0	13	1.2	4.3	4.5
65355	9.8N	1.1E	342	MS	109	3	3	1	1.3	-13.3	13.4
67223	13.1S	39.0E	534	S8	59	8	14	2	2.3	13.6	13.8
68014	19.6S	18.1E	1411	S8	59	1	2	0	0.7	-6.9	6.9
68030	18.5S	25.6E	1071	S8	79	1	1	0	4.4	8.7	9.7
68312	26.5S	18.1E	1067	S8	59	0	0	0	0.7	4.7	4.8
68338	26.9S	24.6E	1234	S8	57	57	100	0			
68396	26.5S	31.3E	641	S8	52	0	0	2	1.4	4.8	5.0
68575	30.0S	30.0E	1175	S8	101	101	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	114	0	0	0	5.0	5.5	7.4
35416	49.1N	54.7E	128	S	56	0	0	4	0.8	4.0	4.1
36982	41.9N	78.2E	3635	S7	111	1	1	0	0.9	6.5	6.6
38565	40.6N	65.7E	485	MS	113	60	53	0	1.1	-0.2	1.1
40435	24.5N	44.4E	991	MS	59	0	0	3	1.5	7.6	7.7
40700	39.6N	47.9E	45	MS	109	1	1	2	1.0	-4.9	5.0
40713	37.4N	46.3E	1475	MS	114	1	1	0	0.5	12.7	12.7
40726	36.8N	45.7E	1384	MS	105	0	0	0	0.8	4.5	4.6
40741	36.5N	61.2E	235	MS	109	0	0	0	1.0	-4.7	4.8
40780	33.6N	46.4E	1362	MS	105	0	0	0	0.5	5.6	5.6
41254	23.1N	57.6E	1755	S8	81	81	100	0			
44265	46.1N	91.5E	1186	MS	112	1	1	1	0.9	6.4	6.5
44416	28.6N	81.6E	720	MS	67	1	1	1	1.0	4.6	4.7
47022	40.8N	128.2E	1224	S	104	0	0	2	1.7	4.3	4.6
48924	21.1N	101.5E	644	S	37	0	0	0	0.8	11.4	11.4
48925	20.7N	102.0E	550	S	48	1	2	0	0.7	-9.6	9.6
48957	14.8N	106.8E	105	MS	31	0	0	3	1.2	4.0	4.2
50727	47.2N	119.9E	1028	MS	114	0	0	0	0.6	4.2	4.2
51495	43.2N	91.7E	874	M	109	0	0	0	0.8	6.5	6.5
56462	29.0N	101.5E	2994	S	114	0	0	0	0.9	7.9	8.0
56768	25.0N	101.5E	1773	S	113	0	0	0	0.6	-5.4	5.4
57816	26.6N	106.7E	1074	MS	114	48	42	0	0.5	-14.3	14.3

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	122	MS	28	0	0	0	1.3	-5.0	5.2
80315	3.0N	75.3W	439	MS	75	0	0	0	0.8	-4.5	4.6
82181	2.0S	54.1W	146	MS	82	0	0	0	0.7	5.1	5.1
82704	7.6S	72.7W	170	MS	78	2	3	0	1.0	-4.1	4.2
83235	12.4S	46.4W	604	MS	84	0	0	1	0.8	7.0	7.0
83332	14.1S	46.4W	826	MS	82	54	66	0	0.4	14.6	14.6
83470	17.9S	50.9W	727	MS	83	0	0	0	0.8	-5.7	5.8
83531	18.6S	46.5W	940	MS	83	0	0	0	0.7	-6.9	6.9
83738	22.5S	44.5W	440	MS	48	0	0	100	1.3	-6.9	7.0
83836	25.5S	50.6W	837	MS	84	0	0	0	0.9	-5.4	5.5
84377	3.8S	73.3W	125	MS	111	0	0	1	1.4	4.2	4.4
84401	5.2S	80.6W	49	MS	110	0	0	0	0.8	4.1	4.2
84425	5.9S	76.1W	179	MS	43	0	0	0	1.5	4.1	4.4

84455	6.5S	76.4W	281	MS	83	0	0	0	1.6	7.9	8.1
84472	7.1S	78.5W	2620	S	54	0	0	0	0.9	-5.5	5.6
84474	7.2S	76.7W	350	S	26	0	0	0	1.2	9.1	9.2
84686	13.6S	72.0W	3248	S	108	0	0	0	0.9	-4.7	4.8
84688	13.7S	73.4W	3444	S	44	0	0	0	0.4	-12.5	12.5
84720	14.9S	75.0W	567	MS	54	0	0	0	0.9	5.9	6.0
84782	18.1S	70.3W	468	MS	91	0	0	1	1.5	8.1	8.2
85140	14.3S	67.4W	140	MS	53	0	0	2	1.8	6.6	6.8
85264	18.5S	64.1W	1998	S	53	7	13	0	1.4	-12.8	12.9
85312	19.8S	63.9W	992	S	45	4	9	9	2.3	-10.6	10.8
85406	18.3S	70.3W	55	M	113	0	0	0	1.2	4.4	4.6
85432	22.5S	68.9W	2320	S8	77	0	0	0	0.6	4.5	4.5

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71049	66.0N	91.8W	150	MS	27	19	70	15	5.3	8.4	9.9
71181	47.1N	55.3W	29	MS	113	0	0	0	0.7	-5.6	5.6
71408	47.4N	55.8W	35	S	97	0	0	72	0.8	-4.2	4.3
71475	49.3N	124.8W	2	MS	112	0	0	0	0.8	-8.3	8.3
71747	48.8N	91.6W	424	S	101	0	0	0	0.6	4.2	4.2
72327	36.1N	86.7W	182	MS	112	0	0	0	0.6	4.2	4.2
76055	31.0N	114.9W	440	MS	66	66	100	0			
76543	22.0N	98.8W	104	MS	28	0	0	0	0.9	6.7	6.8
76658	19.2N	103.7W	494	MS	20	0	0	0	0.9	5.7	5.8
76683	19.3N	98.3W	2248	MS	73	0	0	1	1.2	4.1	4.3
76762	17.5N	99.5W	1265	MS	49	0	0	0	0.9	6.0	6.1
76903	14.9N	92.3W	118	MS	66	0	0	0	0.7	6.0	6.0
78588	17.2N	87.5W	-289	M	115	94	82	0	0.5	0.2	0.5
78655	14.0N	89.6W	725	MS	25	1	4	4	0.7	8.1	8.1

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	36	0	0	97	1.6	8.0	8.2
94130	14.8S	131.9E	120	MS	113	0	0	0	1.1	5.2	5.3
96505	3.7N	115.7E	-9999	8	35	35	100	0			
97378	10.7S	123.1E	1	MS	50	49	98	0	0.0	-13.2	13.2

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	108	0	0	0	0.5	5.7	5.7
06685	47.0N	9.1E	515	MS	115	0	0	0	1.1	5.1	5.2
06780	46.8N	9.8E	2690	S7	115	0	0	1	0.5	4.8	4.8
08912	42.9N	0.8W	1434	MS	340	340	100	0			
08922	42.8N	0.2W	1660	MS	335	335	100	0			
10850	48.8N	10.7E	457	MS	342	0	0	0	0.5	-5.4	5.4
11146	47.1N	13.0E	3105	S7	77	0	0	13	1.6	4.3	4.6
11343	47.1N	13.0E	3105	S7	112	0	0	10	0.8	4.4	4.5
13269	44.3N	19.9E	176	MS	105	0	0	1	0.9	7.3	7.4
14554	44.9N	18.4E	136	S	57	0	0	0	0.8	-12.5	12.5
14650	43.8N	18.0E	970	S	56	56	100	0			
16344	39.3N	16.4E	1710	S8	92	0	0	1	1.1	6.1	6.2
17203	38.9N	40.5E	1177	S8	114	0	0	0	0.7	4.7	4.8

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	97	1	1	3	1.8	-8.3	8.5
89253	63.2S	55.4W	75	M	202	0	0	0	2.3	4.3	4.9
89263	66.0S	66.1W	20	M	250	21	8	0	8.5	5.3	10.0
89264	71.4S	68.9W	780	S	262	0	0	0	1.6	6.6	6.8

89512	70.8S	11.8E	140	MS	114	0	0	0	1.6	-4.6	4.9
89610	65.9S	113.1E	90	S	265	0	0	0	1.8	-8.0	8.2
89614	66.6S	111.2E	500	S	272	272	100	0			
89744	74.0S	43.1E	3353	S	278	0	0	0	0.8	7.4	7.4
89811	66.7S	112.8E	1366	S	267	0	0	0	1.9	-4.7	5.1
89868	79.9S	170.0E	60	S	286	0	0	0	1.6	-4.4	4.7

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	2868	0	35	1.4	0.2	2847	0	35	0	5.3	0.6
AAL	6053	1	32	1.3	0.1	5860	0	32	0	5.8	0.0
AAR	1475	0	5	1.5	-0.4	1468	0	5	0	7.1	-0.1
ACA	2780	1	4	1.6	-0.1	2524	0	5	0	7.6	0.4
ACI	26	0	42	1.0	0.1	26	0	42	0	5.7	-0.4
AEA	1083	0	3	1.6	0.4	766	0	2	0	6.0	0.8
AEL	654	1	7	1.6	-0.1	570	0	6	0	6.5	0.7
AEW	79	3	10	2.2	-0.5	79	0	9	0	9.9	1.0
AFL	551	0	2	1.8	0.3	497	0	4	0	8.0	0.3
AFR	1543	0	4	1.4	0.2	1417	0	5	0	7.1	0.5
AIS	345	2	9	1.9	-0.3	332	0	11	0	9.0	0.4
AJM	452	0	3	1.5	-0.1	407	0	3	0	6.2	0.8
AJX	540	1	5	1.6	1.1	515	0	5	0	6.3	0.5
AMM	189	0	1	1.5	0.4	173	0	3	0	8.0	0.3
AMT	1690	0	36	1.0	-0.3	1686	0	37	0	5.3	-0.1
AMX	312	1	5	1.5	0.2	272	0	5	0	7.2	0.5
ANA	43	0	0	1.7	0.2	42	0	0	0	5.6	0.4
ANZ	4357	0	26	1.3	0.0	4350	0	26	0	6.2	0.4
ATN	113	4	100	4.0	-2.4	108	0	23	0	8.8	1.0
AVA	187	1	5	2.2	1.1	154	0	1	0	6.4	1.1
AVN	111	0	46	0.8	0.3	109	0	46	0	5.4	0.7
AXF	35	9	40	1.1	-0.7	35	0	37	0	5.1	0.8
AZA	656	0	3	1.5	-0.4	607	0	5	0	8.0	0.4
BAF	25	0	8	2.1	0.1	24	0	8	0	5.6	0.5
BAL	191	1	8	1.3	0.2	182	0	8	0	7.0	0.7
BAW	745	1	8	1.8	-0.2	710	1	8	0	6.7	0.6
BBR	177	2	3	1.7	1.2	150	0	3	0	8.1	2.3
BHP	36	0	8	2.0	-1.0	31	0	6	0	6.5	0.5
BPA	419	0	5	1.4	0.2	377	0	6	0	6.3	0.2
BSK	46	0	17	1.4	-0.3	46	0	22	0	8.5	-1.6
BWA	281	1	3	1.7	0.3	238	0	1	0	6.0	1.0
CAL	59	0	8	1.8	-0.3	59	0	10	0	10.6	0.8
CCA	232	1	12	2.3	0.0	228	1	100	0	9.5	-0.3
CES	153	3	8	1.3	0.2	155	1	9	0	7.6	0.2
CFC	52	0	13	1.3	-0.4	48	0	17	0	5.9	-0.4
CFG	851	0	4	1.7	-0.3	727	0	3	0	6.9	0.4
CKK	60	0	3	1.1	0.5	59	2	5	0	8.9	0.1
CKS	330	10	39	1.9	1.0	324	1	30	0	8.4	0.0
CLX	288	0	6	1.7	-0.3	228	0	7	0	8.6	-0.3
COA	148	2	24	1.7	0.2	126	1	24	0	7.6	1.3
CPA	31	0	16	0.9	0.5	32	0	16	0	4.9	2.0
CRL	772	2	4	1.5	0.4	674	0	4	0	7.6	0.8
CSN	48	2	10	1.6	0.5	49	0	8	0	8.0	0.7
CUB	237	1	6	1.9	0.2	214	0	7	0	7.3	0.7
DAF	27	0	0	1.1	-0.3	24	0	4	0	6.4	0.2
DAL	2791	0	28	1.3	-0.2	2710	0	29	0	6.1	0.2
DBR	29	0	7	2.2	-0.5	35	0	11	0	11.2	-0.3
DCE	271	1	8	1.2	-0.5	261	0	9	0	7.3	-0.1
DHL	107	6	100	6.4	-6.2	104	0	100	0	18.2	3.8
DLH	1199	1	16	1.7	-0.2	1105	0	18	0	6.8	0.5
EDW	118	0	2	1.5	0.0	117	0	0	0	5.3	0.8
EEZ	118	2	6	1.5	-0.1	111	0	4	0	5.0	0.7
EIA	423	1	17	1.7	0.7	409	0	100	0	18.7	5.1
ELY	305	1	4	1.7	0.2	305	0	5	0	7.9	-0.1
ETH	21	0	5	1.2	0.5	21	0	5	0	6.8	1.1
EVA	98	3	5	1.0	0.0	103	0	3	0	7.2	0.8
FDX	1903	0	43	1.3	0.3	1910	0	44	0	7.3	0.4
FIN	310	0	3	1.7	0.1	277	0	5	0	8.0	0.2
FJI	918	1	44	1.6	0.6	895	1	44	0	8.2	-0.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

FLC	37	0	27	1.3	0.8	37	0	27	0	5.4	1.5
FOM	591	0	36	1.5	-0.1	587	0	36	0	5.9	0.9
GAF	51	0	8	2.3	-1.0	43	2	5	0	4.9	0.8
GCO	358	0	5	1.3	0.3	362	0	100	0	7.4	0.8
GHA	43	2	5	0.9	0.1	35	0	3	0	5.6	0.6
GRL	110	1	2	1.5	0.0	91	0	0	0	3.8	0.2
GTI	317	2	14	2.0	0.6	315	0	12	0	8.1	-0.2
HAL	4291	0	33	1.1	-0.1	4246	0	33	0	5.5	0.1
HLN	109	1	4	1.4	-0.8	99	0	4	0	8.1	0.4
HRH	150	0	61	1.2	0.2	150	0	61	0	5.7	1.3
IBE	2622	0	5	1.8	0.5	2172	0	5	0	6.7	0.5
ICE	814	1	4	1.5	-0.2	789	1	3	0	6.9	0.5
IWD	446	1	2	1.2	0.3	381	0	1	0	5.2	0.7
JAA	100	3	7	1.9	1.5	94	0	4	0	6.0	1.4
JAL	2388	0	4	1.6	0.5	2312	0	4	0	7.4	0.2
JAZ	1118	0	3	1.5	1.1	1073	0	3	0	5.7	0.4
JBU	79	0	1	1.0	0.5	79	0	4	0	5.0	1.1
KAL	2986	1	8	1.5	0.0	2963	0	8	0	7.5	0.2
KLM	1725	0	6	1.5	0.2	1562	0	7	0	6.4	0.5
LAN	416	0	4	1.7	-0.5	413	0	4	0	5.3	1.1
LAP	87	0	43	2.8	0.7	83	0	37	0	7.9	1.8
LDA	21	0	10	0.7	0.2	20	0	15	0	4.6	-1.2
LDI	640	0	3	1.3	-0.4	535	0	4	0	7.8	0.4
LOT	141	0	4	1.8	-1.1	127	1	6	0	6.5	0.6
LTU	916	0	4	1.4	0.0	781	0	5	0	6.9	0.7
LXR	128	1	9	2.0	0.1	107	0	8	0	8.9	1.1
MAS	255	0	10	2.1	0.1	257	0	6	0	7.1	-0.1
MON	110	0	0	1.0	0.1	103	0	1	0	4.7	0.3
MPD	408	0	8	2.5	1.2	348	0	3	0	6.3	0.4
MPH	726	0	3	1.7	-1.0	655	0	5	0	7.6	0.2
MYT	338	0	2	1.4	-0.1	316	0	2	0	5.4	0.2
NAO	367	1	35	1.3	0.1	364	0	35	0	5.8	0.1
NCA	803	0	4	2.0	0.3	617	0	5	0	7.5	-0.2
NWA	8467	1	9	1.7	0.2	8324	0	8	0	7.6	0.4
NZL	3360	0	10	1.4	-0.3	3360	0	10	0	4.6	0.4
OAE	486	0	24	1.2	-0.3	485	0	29	0	9.9	1.3
OOM	182	0	13	2.4	1.4	157	0	13	0	8.7	0.7
PAC	609	0	12	1.6	0.1	614	0	13	0	8.3	-0.3
PAL	1078	1	6	1.4	0.2	1025	0	6	0	7.0	0.7
PAO	306	0	57	1.1	0.2	304	1	59	0	9.4	0.0
PLM	221	0	4	1.8	1.0	152	0	4	0	6.4	0.6
PUA	37	5	57	2.7	0.1	33	6	64	0	17.7	0.9
QFA	2921	0	48	1.2	0.1	2922	0	48	0	5.4	0.2
QQA	43	0	47	1.4	-0.2	44	0	48	0	10.4	-1.7
RAF	24	0	8	1.9	0.7	24	0	8	0	5.7	1.1
RAM	285	1	3	1.7	0.3	206	0	100	0	7.7	0.9
RCH	273	1	18	2.8	0.2	241	0	100	0	9.6	1.2
ROM	43	0	2	1.8	-0.5	40	0	3	0	7.0	0.9
RRR	126	1	9	1.9	0.2	118	0	11	0	9.9	0.5
RZO	466	1	3	1.4	-0.3	321	0	3	0	7.7	0.2
SAA	429	1	3	1.4	-0.2	391	0	3	0	6.4	0.6
SEU	121	0	6	1.6	0.1	117	0	8	0	9.7	1.3
SIA	261	0	2	1.5	0.2	261	0	2	0	5.1	0.7
SLR	276	0	7	1.3	0.0	272	0	7	0	6.4	0.0
SQC	47	0	2	1.8	0.6	47	0	0	0	5.6	0.8
SVA	29	0	0	1.6	0.3	28	4	11	0	10.8	0.0
TAG	46	4	33	1.8	1.2	43	0	33	0	6.6	0.5
TAM	21	5	19	2.4	0.7	21	0	19	0	11.0	2.6
TAP	465	1	4	1.5	-0.3	275	0	7	0	8.6	0.2

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TCX	91	0	4	1.6	0.6	81	0	4	0	5.4	0.5

THA	114	0	2	1.4	0.2	114	0	4	0	6.8	0.7
THT	122	1	26	1.4	0.5	108	0	29	0	9.0	0.5
TPA	46	0	0	1.1	0.2	44	0	2	0	5.6	-0.5
TSC	236	0	2	1.8	-0.2	205	0	3	0	8.1	0.4
UAE	38	3	39	2.4	-0.2	35	0	31	0	15.7	1.4
UAL	97494	0	91	0.9	-0.1	97405	0	91	0	4.7	0.2
UPS	1919	1	53	1.5	0.1	1860	0	54	0	7.0	0.3
USA	47	0	2	1.2	0.6	48	0	6	0	6.0	0.6
VIR	292	0	3	1.5	-0.1	282	0	6	0	8.7	0.4
VPB	28	0	0	2.0	-0.2	24	0	0	0	6.3	1.5
VRG	96	3	32	2.7	0.5	92	0	100	0	10.3	1.1
VVJ	22	18	32	1.7	0.8	22	0	18	0	7.0	0.2
VVR	25	0	24	2.4	1.0	25	0	20	0	11.6	1.6
WOA	476	0	7	1.6	0.5	463	0	7	0	7.3	0.6
YSS	195	0	3	1.5	0.7	170	0	3	0	6.3	1.0

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AR	1505	0	100	2.8	2.6	1501	0	7	0	5.9	0.5
AU	33117	0	8	1.2	0.4	33371	0	8	0	5.4	0.7
EU	143603	0	23	1.3	0.3	143603	0	23	0	4.5	0.3
KL	2401	0	8	1.2	0.7	2396	0	8	0	5.7	0.6
LN	20	0	40	1.4	0.9	20	0	55	0	17.5	2.2
MK	2438	0	100	1.7	1.5	2418	0	6	0	6.5	0.7
SA	4197	0	5	2.0	1.4	4040	0	5	0	6.7	0.3
TN	70	1	33	2.4	1.1	70	0	30	0	6.1	-0.2

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	823	2	22	2.3	0.9	851	0	20	0	7.8	1.2
US ACARS	814804	0	61	1.2	0.4	814800	0	60	0	5.1	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

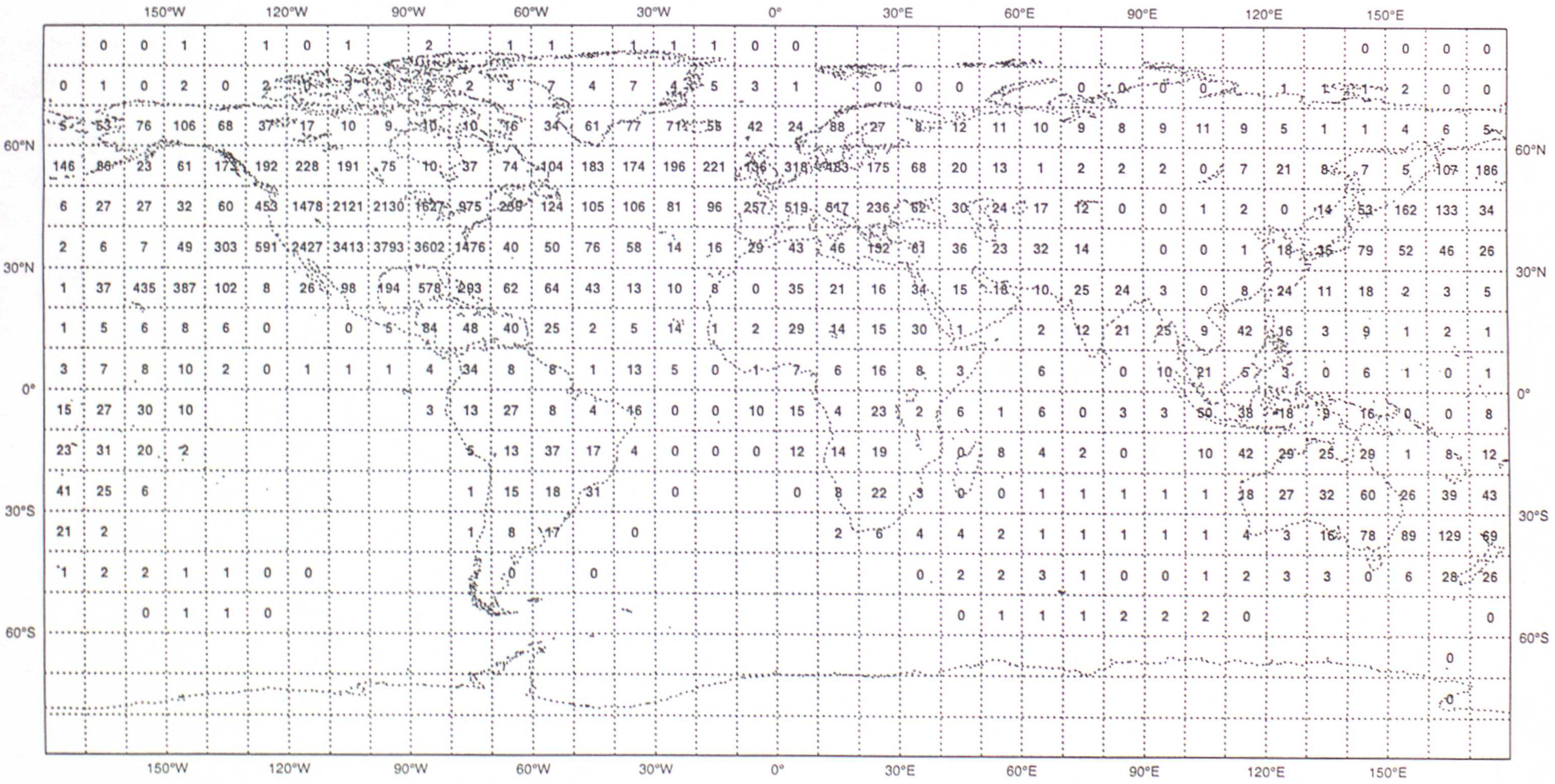
NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	252	1	37	1.4	0.0	251	0	36	0	5.9	1.8
ACA	20	0	15	1.7	-0.2	20	0	25	0	18.1	-1.2
AFR	62	0	11	1.6	-0.1	59	0	10	0	5.0	-0.6
AMT	43	0	33	1.1	-0.3	42	0	33	0	4.2	0.4
ANZ	256	2	34	1.4	-0.2	254	0	34	0	6.9	0.1
AVN	32	0	50	3.3	0.2	32	0	47	0	9.0	2.0
AXF	42	0	60	1.2	-0.3	41	0	63	0	5.3	1.4
AZA	20	0	5	1.7	-1.0	20	0	5	0	5.0	0.7
CFC	37	0	3	1.7	0.0	34	0	0	0	6.0	-0.3
CFG	25	0	0	0.8	0.0	22	0	5	0	6.1	1.6
CKS	47	2	11	1.4	-0.4	48	0	13	0	11.9	-2.0
CRL	35	0	3	1.5	0.4	32	0	13	0	6.5	0.0
DAF	25	4	16	3.4	1.2	21	0	0	0	5.0	0.1
DAL	188	0	35	1.1	0.2	185	0	35	0	6.6	1.4
DHL	48	0	100	6.5	-6.4	42	0	100	0	15.9	5.8
DLH	202	0	15	1.6	-0.2	200	0	16	0	6.6	0.2
EIA	57	0	14	1.4	0.7	54	0	100	0	19.5	7.2
FDX	377	0	27	1.4	0.2	375	0	29	0	8.1	0.2
FIN	20	0	5	1.6	0.0	20	0	10	0	8.4	0.9
FXI	47	2	26	3.7	2.4	37	0	5	0	8.8	2.4
GAF	36	0	0	0.9	0.0	36	0	3	0	7.6	-1.0
GCO	80	0	5	1.1	0.2	79	3	100	0	9.4	1.8
GTI	32	0	19	1.8	0.4	32	0	16	0	7.2	-1.7
HAL	204	1	38	0.9	-0.1	203	0	38	0	6.1	1.5
ICE	40	0	13	2.5	0.0	37	0	5	0	10.4	0.1
JAL	25	4	8	1.6	-0.2	25	0	4	0	8.6	2.9
JAZ	47	2	2	1.4	0.9	45	0	2	0	6.6	0.8
KAL	61	5	21	1.6	-0.8	62	0	18	0	7.0	-0.9
KIW	44	0	50	3.3	1.0	42	0	45	0	5.7	-0.3
KLM	49	0	2	1.6	0.0	50	0	6	0	5.6	-0.5
LAN	44	2	11	0.9	0.4	43	0	12	0	7.5	1.2
MAS	29	0	14	1.1	-0.4	29	0	14	0	4.9	1.7
MPH	62	3	3	1.3	-0.5	63	0	2	0	6.2	0.9
NCA	74	0	0	1.1	0.7	66	0	2	0	6.8	-1.0
NWA	464	1	9	1.5	0.3	462	0	10	0	7.7	-0.9
NZL	19419	0	53	1.0	0.2	19419	0	53	0	4.5	0.0
OAE	23	0	13	1.2	0.2	22	0	36	0	13.4	1.7
PAC	22	0	5	2.2	0.0	20	0	10	0	9.6	0.0
PAL	27	0	19	0.8	0.1	25	0	20	0	8.7	1.5
QFA	252	1	43	1.4	-0.1	253	0	42	0	6.7	0.3
RCH	35	0	17	3.0	0.2	34	0	100	0	8.5	2.3
RRR	205	3	19	3.0	1.0	207	0	15	0	9.3	0.3
SIA	49	0	4	0.8	0.3	50	0	4	0	4.3	0.3
UAL	199234	0	98	1.1	-0.1	198813	0	98	0	3.9	0.4
UPS	143	1	52	1.4	-0.3	134	0	51	0	9.3	-0.1
WOA	111	0	15	2.9	-0.4	113	0	10	0	8.1	1.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AR	858	0	100	1.8	1.4	851	0	42	0	4.7	0.7
AU	30776	0	52	1.1	0.4	31164	0	52	0	4.6	-0.1
EU	591631	0	68	1.0	0.3	590680	0	68	0	3.6	0.0
KL	1783	0	60	1.4	0.6	1773	0	60	0	4.5	0.7
MK	1785	0	100	1.4	0.6	1757	0	49	0	4.5	0.7
SA	2402	0	56	1.7	0.7	2298	0	56	0	4.7	0.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	27	4	11	3.0	-0.5	32	0	13	0	10.0	0.3
US ACARS	1570173	0	78	1.1	0.2	1564861	0	78	0	3.8	0.4

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 38202



	0	0	1		1	0	1		2		1	1		1	1	1	0	0														0	0	0	0
0	1	0	2	0	2	0	3	3	2	2	3	7	4	7	4	5	3	1		0	0	0			0	0	0	0		1	1	1	2	0	0
5	53	76	106	68	37	17	10	9	10	10	16	34	61	77	71	55	42	24	88	27	8	12	11	10	9	8	9	11	9	5	1	1	4	6	5
146	86	23	61	172	192	228	191	75	10	37	74	104	183	174	196	221	136	318	483	175	68	20	13	1	2	2	2	0	7	21	8	7	5	107	186
6	27	27	32	60	453	1478	2121	2130	1627	975	259	124	105	106	81	96	257	519	817	236	62	30	24	17	12	0	0	1	2	0	14	53	162	133	34
2	6	7	49	303	591	2427	3413	3793	3602	1476	40	50	76	58	14	16	29	43	46	192	61	36	23	32	14		0	0	1	18	35	79	52	46	26
1	37	435	387	102	8	26	98	194	578	293	62	64	43	13	10	8	0	35	21	16	34	15	18	10	25	24	3	0	8	24	11	18	2	3	5
1	5	6	8	6	0		0	5	84	48	40	25	2	5	14	1	2	29	14	15	30	1		2	12	21	25	9	42	16	3	9	1	2	1
3	7	8	10	2	0	1	1	1	4	34	8	8	1	13	5	0	1	7	6	16	8	3		6		0	10	21	5	3	0	6	1	0	1
15	27	30	10						3	13	27	8	4	16	0	0	10	15	4	23	2	6	1	6	0	3	3	50	38	18	9	16	0	0	8
23	31	20	2							5	13	37	17	4	0	0	0	12	14	19		0	8	4	2	0		10	42	29	25	29	1	8	12
41	25	6								1	15	18	31		0			0	8	22	3	0	0	1	1	1	1	1	18	27	32	60	26	39	43
21	2									1	8	17		0					2	6	4	4	2	1	1	1	1	1	4	3	16	78	89	129	69
1	2	2	1	1	0	0					0		0								0	2	2	3	1	0	0	1	2	3	3	0	6	28	26
		0	1	1	0																	0	1	1	1	2	2	2	0						0
																																		0	
																																		0	

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 77931

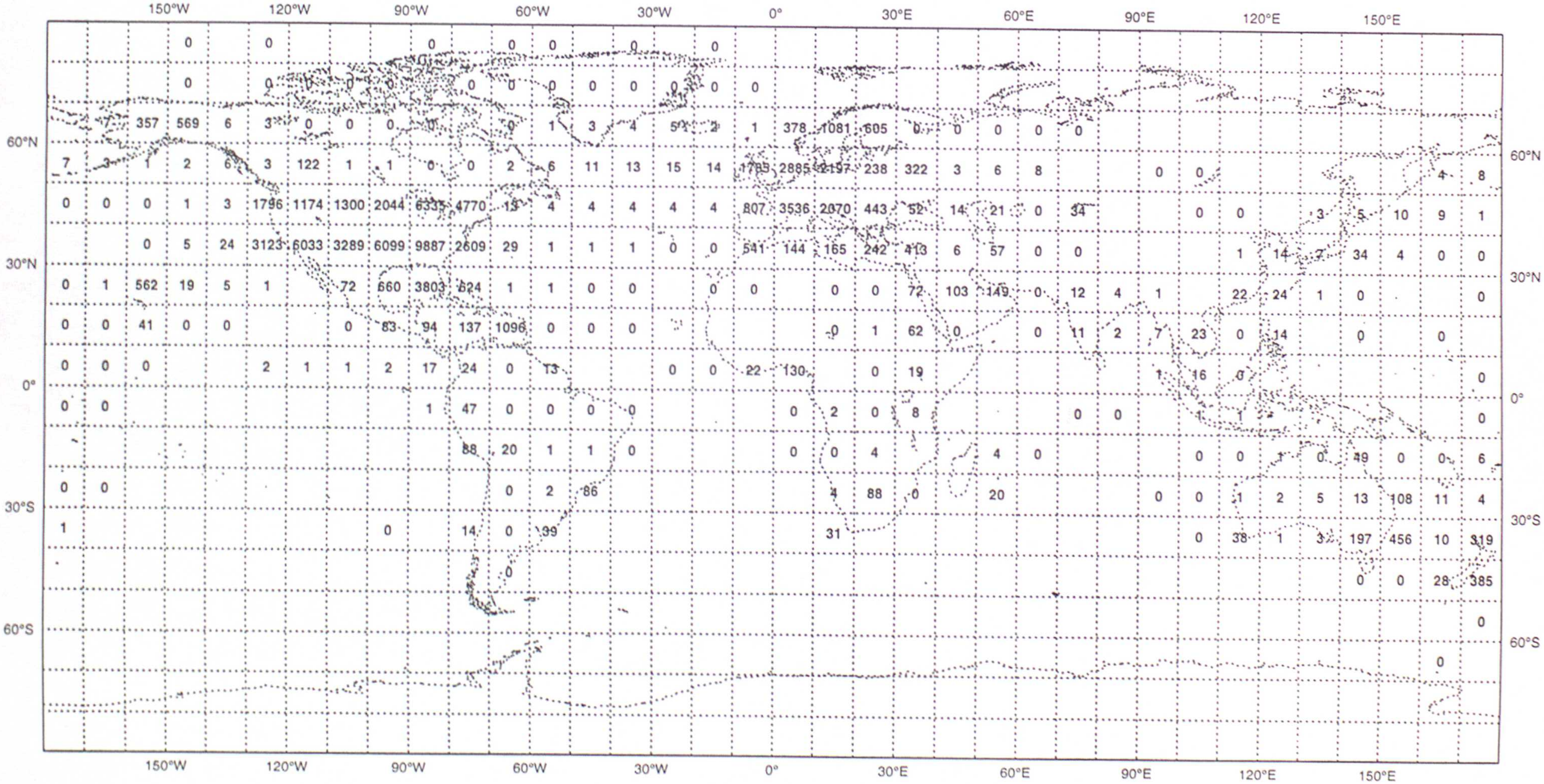

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0
357 569 6 3 0 0 0 0 0 1 3 4 5 2 1 378 1081 605 0 0 0 0 0
7 3 1 2 6 3 122 1 1 0 0 2 6 11 13 15 14 1785 2885 2157 238 322 3 6 8 0 0 4 8
0 0 0 1 3 1796 1174 1300 2044 6335 4770 13 4 4 4 4 4 807 3536 2070 443 52 14 21 0 34 0 0 3 5 10 9 1
0 5 24 3123 6033 3289 6099 9887 2609 29 1 1 1 0 0 541 144 165 242 413 6 57 0 0 1 14 7 34 4 0 0
0 1 562 19 5 1 72 660 3803 624 1 1 0 0 0 0 0 0 72 103 149 0 12 4 1 22 24 1 0 0
0 0 41 0 0 0 83 94 137 1096 0 0 0 0 1 62 0 0 11 2 7 23 0 14 0 0
0 0 0 2 1 1 2 17 24 0 13 0 0 22 130 0 19 1 16 0 0
0 0 1 47 0 0 0 0 0 2 0 8 0 0 1 1 0
88 20 1 1 0 0 0 4 4 0 0 0 1 0 49 0 0 6
0 0 0 2 86 4 88 0 20 0 0 1 2 5 13 108 11 4
1 0 14 0 99 31 0 38 1 3 197 456 10 319
0 0 0 28 385
0
0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

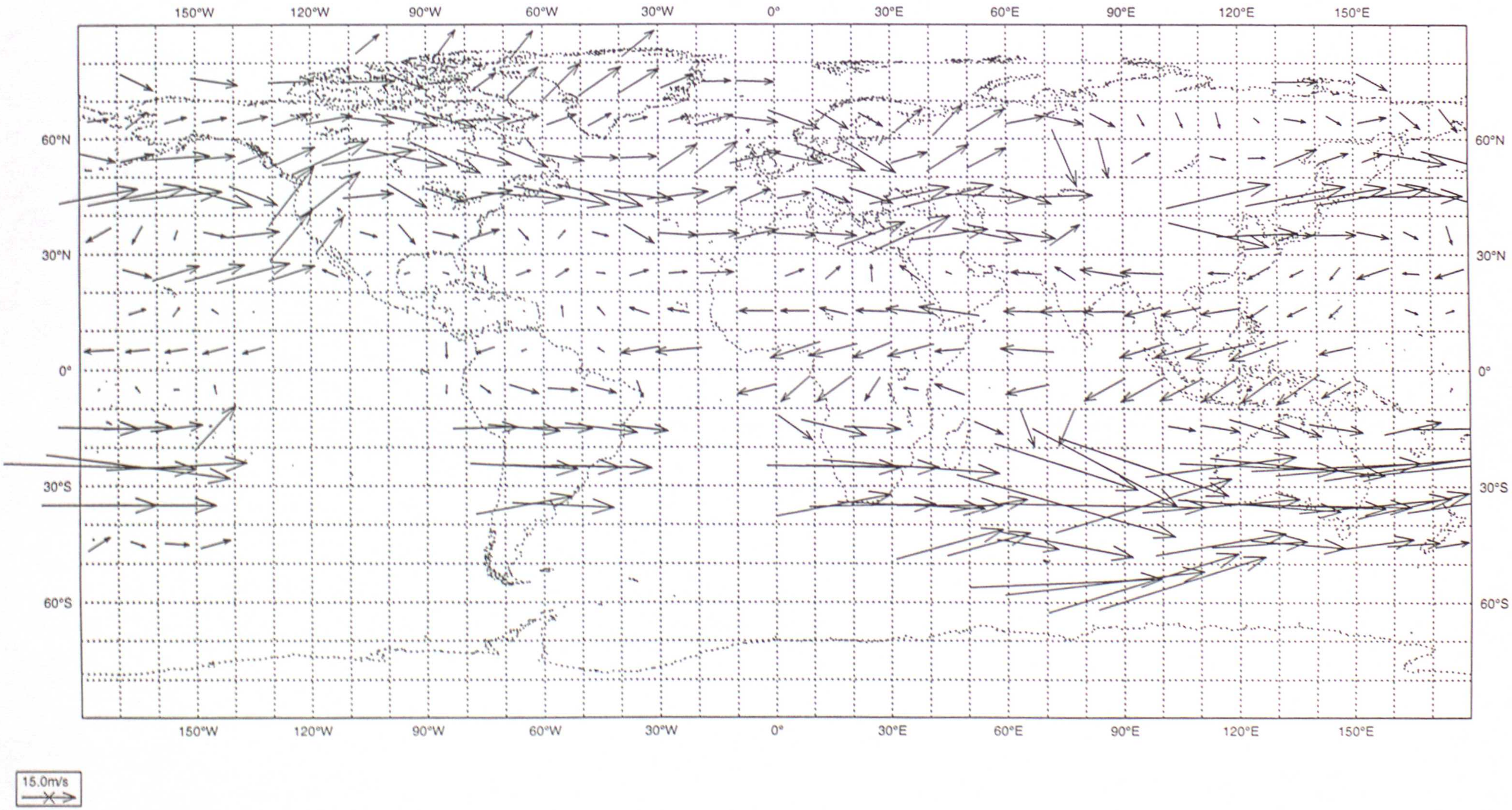

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

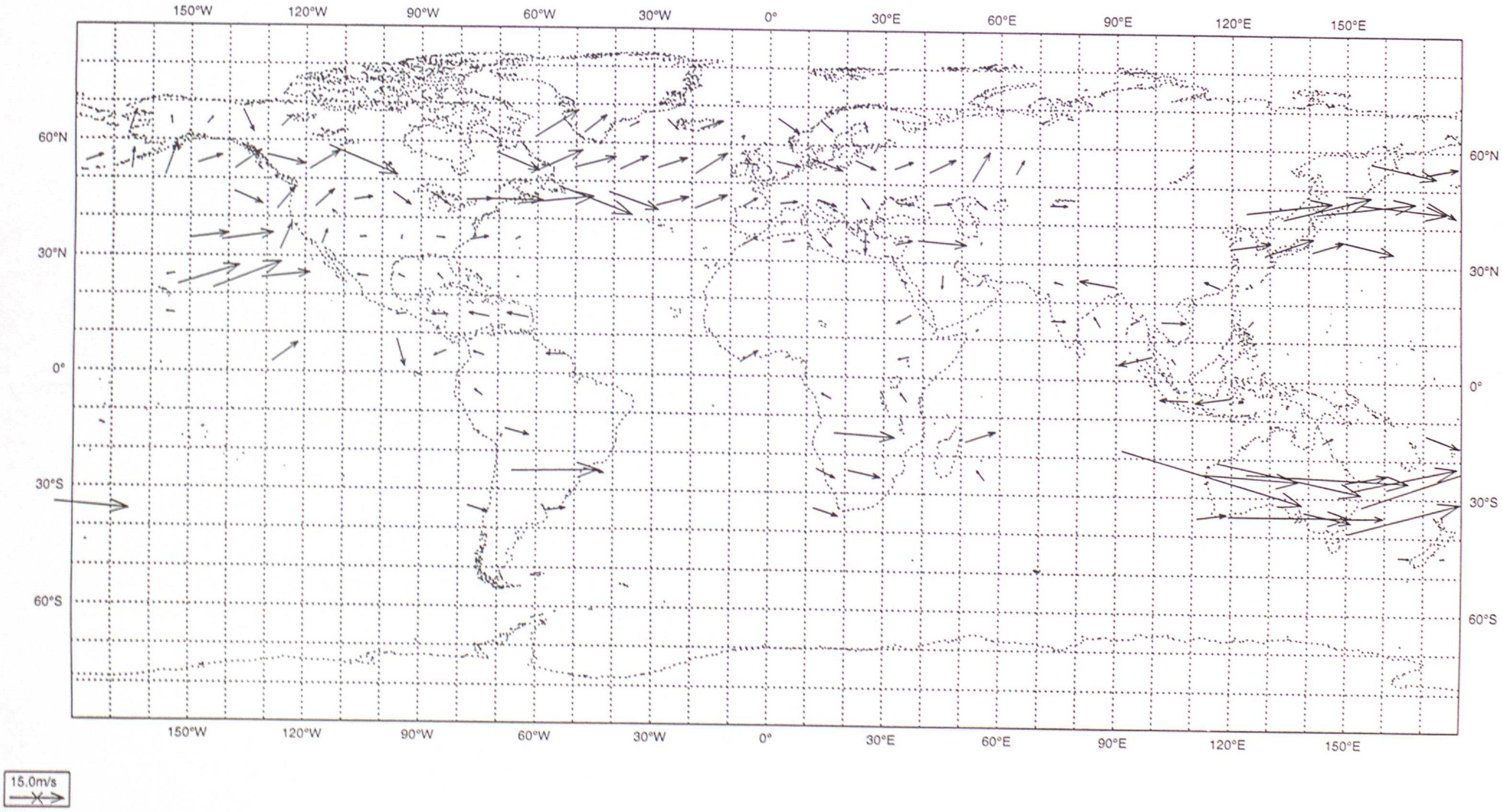

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

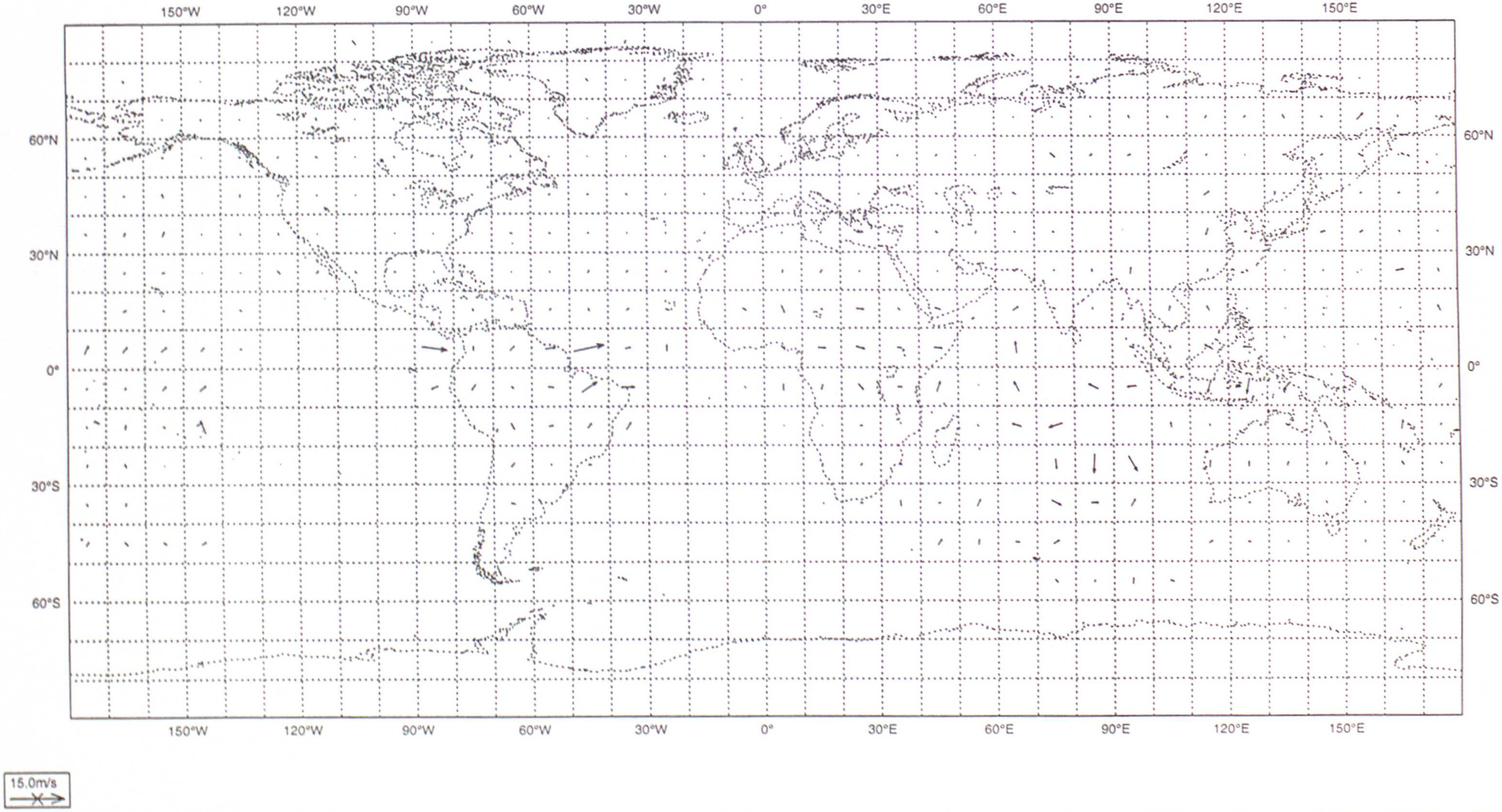

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

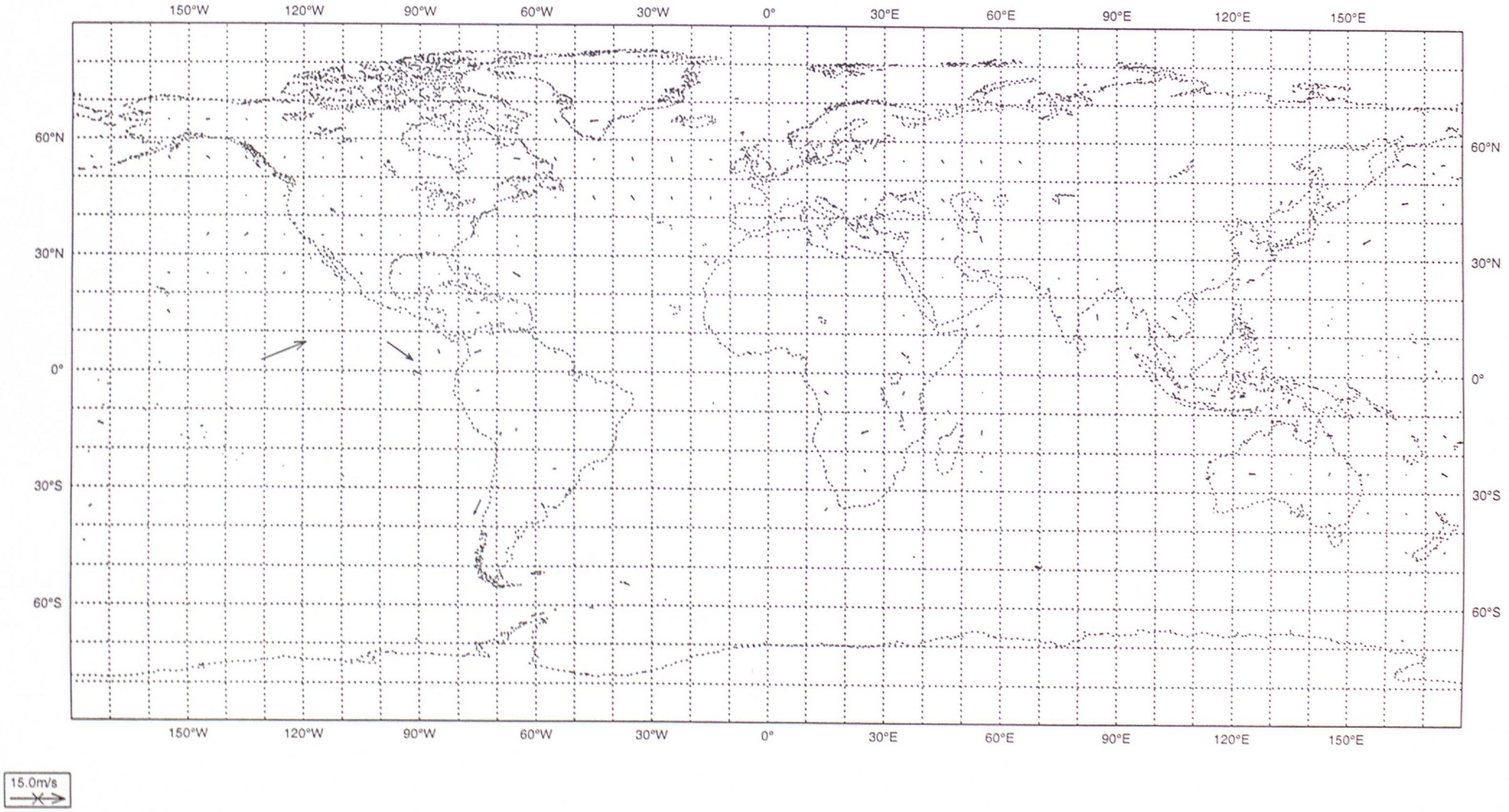

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

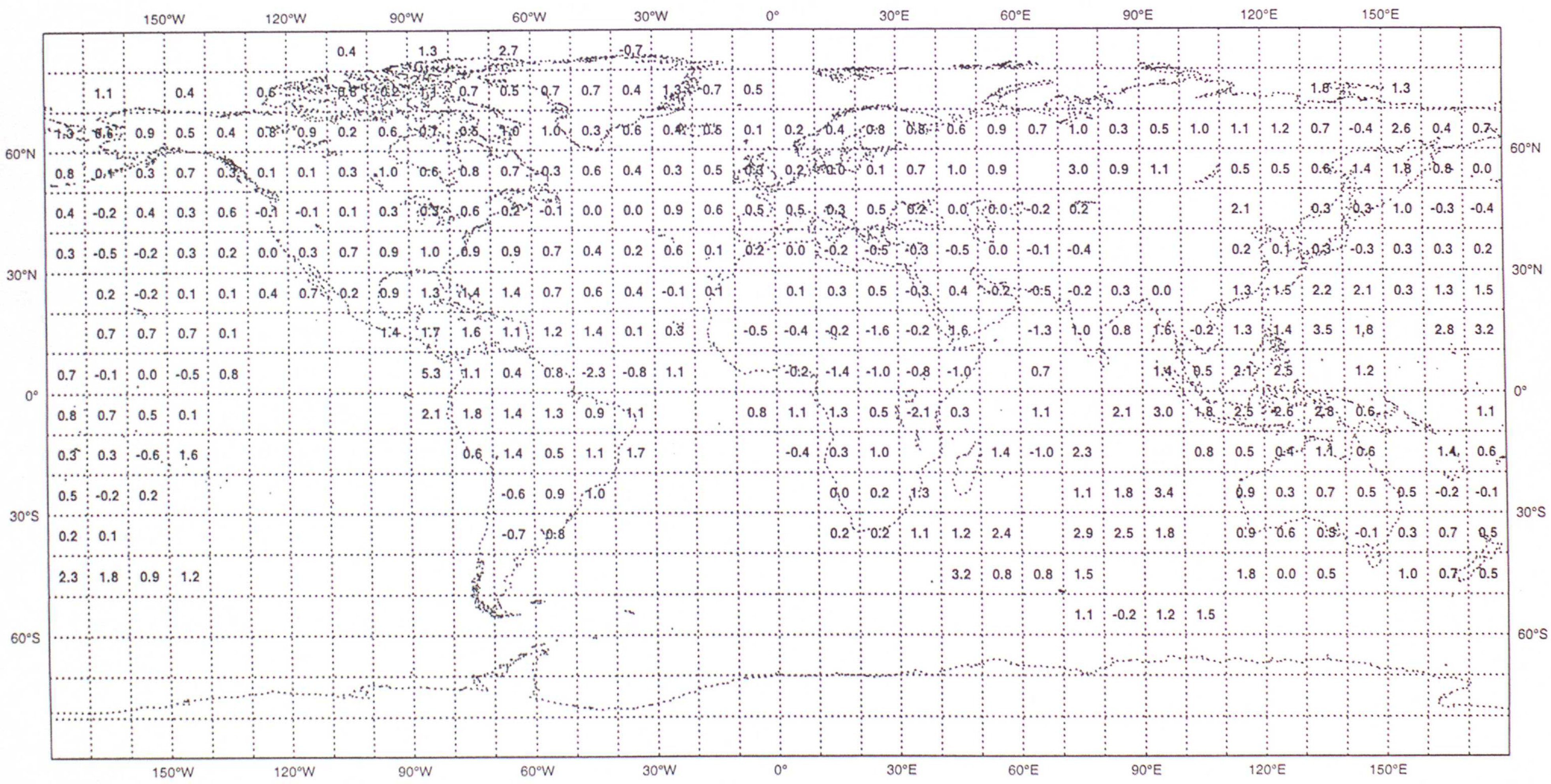

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.4 1.3 2.7 -0.7
1.1 0.4 0.6 0.8 0.2 1.1 0.7 0.5 0.7 0.7 0.4 1.3 0.7 0.5 1.8 1.3
1.3 0.6 0.9 0.5 0.4 0.8 0.9 0.2 0.6 0.7 0.5 1.0 1.0 0.3 0.6 0.4 0.5 0.1 0.2 0.4 0.8 0.8 0.6 0.9 0.7 1.0 0.3 0.5 1.0 1.1 1.2 0.7 -0.4 2.6 0.4 0.7
0.8 0.4 0.3 0.7 0.3 0.1 0.1 0.3 1.0 0.6 0.8 0.7 0.3 0.6 0.4 0.3 0.5 0.3 0.2 0.0 0.1 0.7 1.0 0.9 3.0 0.9 1.1 0.5 0.5 0.6 1.4 1.8 0.8 0.0
0.4 -0.2 0.4 0.3 0.6 -0.1 -0.1 0.1 0.3 0.3 0.6 0.2 -0.1 0.0 0.0 0.9 0.6 0.5 0.5 0.3 0.5 0.2 0.0 0.0 -0.2 0.2 2.1 0.3 0.3 1.0 -0.3 -0.4
0.3 -0.5 -0.2 0.3 0.2 0.0 0.3 0.7 0.9 1.0 0.9 0.9 0.7 0.4 0.2 0.6 0.1 0.2 0.0 -0.2 -0.5 -0.3 -0.5 0.0 -0.1 -0.4 0.2 0.1 0.3 -0.3 0.3 0.3 0.2
0.2 -0.2 0.1 0.1 0.4 0.7 -0.2 0.9 1.3 1.4 1.4 0.7 0.6 0.4 -0.1 0.1 0.1 0.3 0.5 -0.3 0.4 -0.2 -0.5 -0.2 0.3 0.0 1.3 1.5 2.2 2.1 0.3 1.3 1.5
0.7 0.7 0.7 0.1 1.4 1.7 1.6 1.1 1.2 1.4 0.1 0.3 -0.5 -0.4 -0.2 -1.6 -0.2 1.6 -1.3 1.0 0.8 1.6 -0.2 1.3 1.4 3.5 1.8 2.8 3.2
0.7 -0.1 0.0 -0.5 0.8 5.3 1.1 0.4 0.8 -2.3 -0.8 1.1 -0.2 -1.4 -1.0 -0.8 -1.0 0.7 1.4 0.5 2.1 2.5 1.2
0.8 0.7 0.5 0.1 2.1 1.8 1.4 1.3 0.9 1.1 0.8 1.1 1.3 0.5 -2.1 0.3 1.1 2.1 3.0 1.8 2.5 2.6 2.8 0.6 1.1
0.3 0.3 -0.6 1.6 0.6 1.4 0.5 1.1 1.7 -0.4 0.3 1.0 1.4 -1.0 2.3 0.8 0.5 0.4 1.1 0.6 1.4 0.6
0.5 -0.2 0.2 -0.6 0.9 1.0 0.0 0.2 1.3 1.1 1.8 3.4 0.9 0.3 0.7 0.5 0.5 -0.2 -0.1
0.2 0.1 -0.7 0.8 0.2 0.2 1.1 1.2 2.4 2.9 2.5 1.8 0.9 0.6 0.3 -0.1 0.3 0.7 0.5
2.3 1.8 0.9 1.2 3.2 0.8 0.8 1.5 1.8 0.0 0.5 1.0 0.7 0.5
1.1 -0.2 1.2 1.5

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

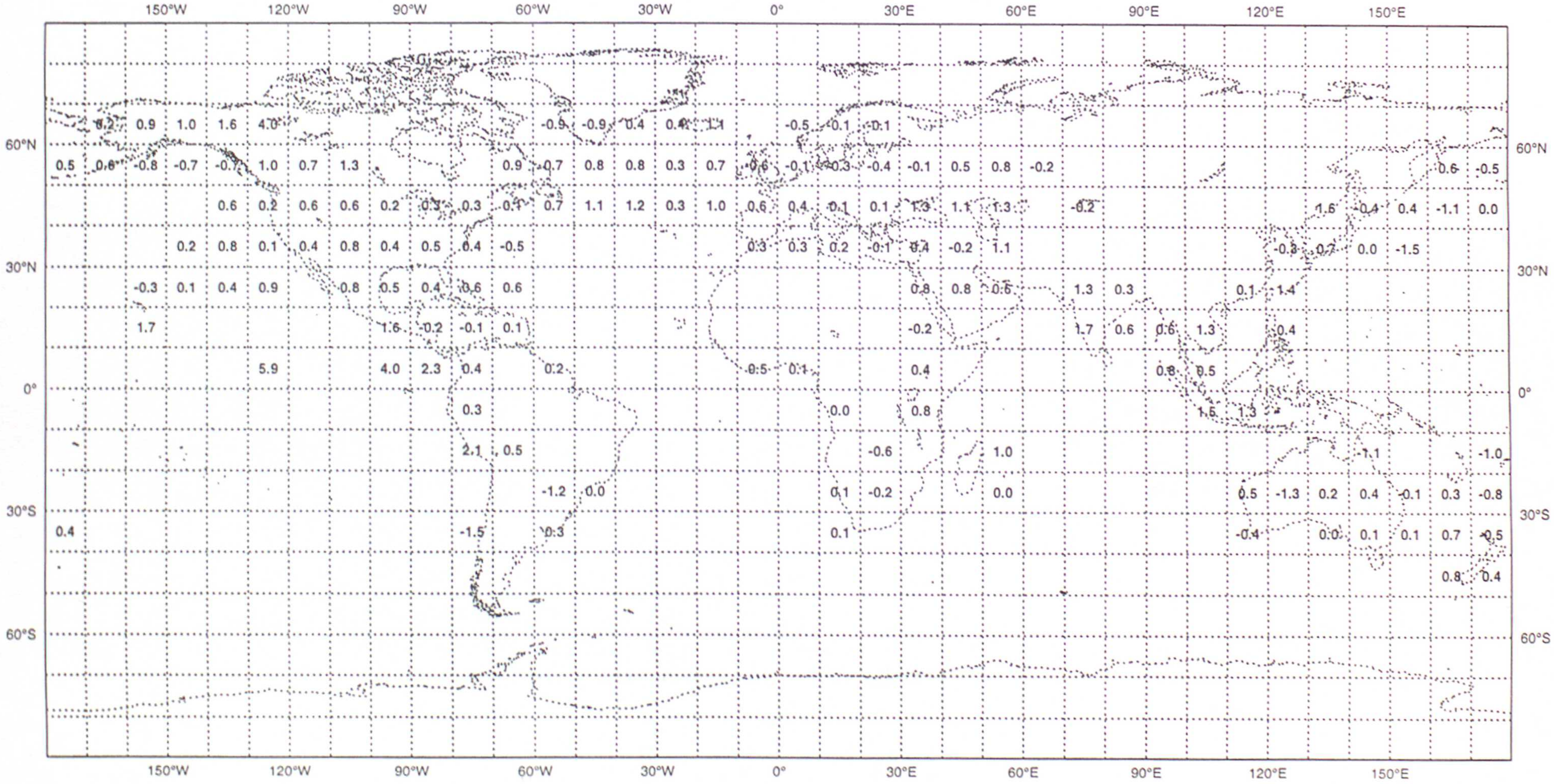

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.2 0.9 1.0 1.6 4.0 -0.9 -0.9 0.4 0.4 1.1 -0.5 -0.1 -0.1
0.5 0.6 -0.8 -0.7 -0.7 1.0 0.7 1.3 0.9 -0.7 0.8 0.8 0.3 0.7 -0.6 -0.1 -0.3 -0.4 -0.1 0.5 0.8 -0.2 0.6 -0.5
0.6 0.2 0.6 0.6 0.2 0.3 0.3 0.1 0.7 1.1 1.2 0.3 1.0 0.6 0.4 0.1 0.1 1.3 1.1 1.3 -0.2 1.6 -0.4 0.4 -1.1 0.0
0.2 0.8 0.1 0.4 0.8 0.4 0.5 0.4 -0.5 0.3 0.3 0.2 -0.1 0.4 -0.2 1.1 -0.3 0.7 0.0 -1.5
-0.3 0.1 0.4 0.9 0.8 0.5 0.4 0.6 0.6 0.8 0.8 0.6 1.3 0.3 0.1 1.4
1.7 1.6 -0.2 -0.1 0.1 -0.2 1.7 0.6 0.6 1.3 0.4
5.9 4.0 2.3 0.4 0.2 -0.5 0.1 0.4 0.8 0.5
0.3 0.0 0.8 1.5 1.3
2.1 0.5 -0.6 1.0 -1.1 -1.0
-1.2 0.0 0.1 -0.2 0.0 0.5 -1.3 0.2 0.4 -0.1 0.3 -0.8
0.4 -1.5 0.3 0.1 -0.4 0.0 0.1 0.1 0.7 -0.5
0.8 0.4

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

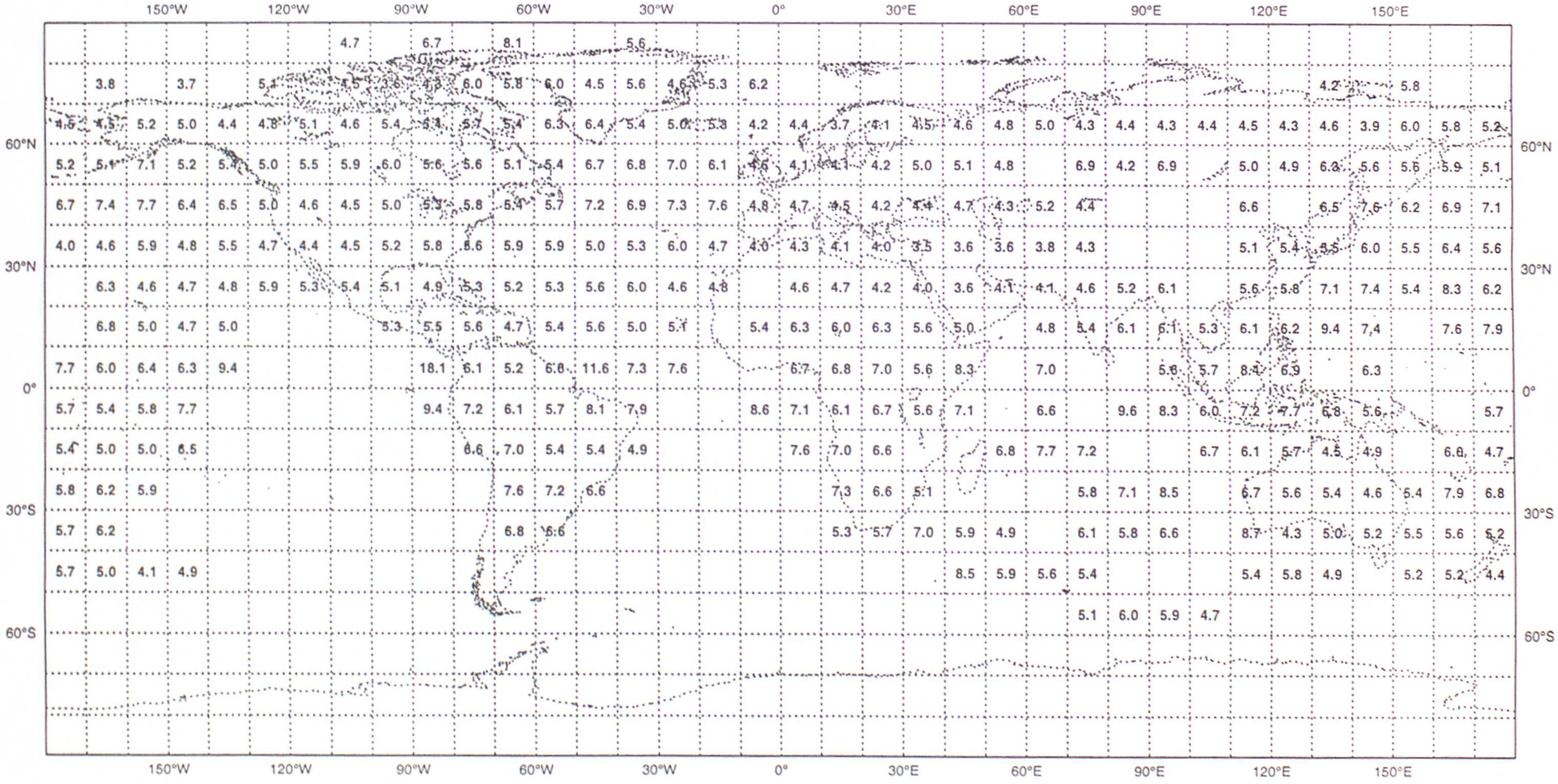

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.7 6.7 8.1 5.6
3.8 3.7 5.4 4.5 5.6 4.3 6.0 5.8 6.0 4.5 5.6 4.6 5.3 6.2 4.2 5.8
4.5 4.5 5.2 5.0 4.4 4.8 5.1 4.6 5.4 5.1 5.7 5.4 6.3 6.4 5.4 5.0 5.3 4.2 4.4 3.7 4.1 4.5 4.6 4.8 5.0 4.3 4.4 4.3 4.4 4.5 4.3 4.6 3.9 6.0 5.8 5.2
5.2 5.4 7.1 5.2 5.4 5.0 5.5 5.9 6.0 5.6 5.6 5.1 5.4 6.7 6.8 7.0 6.1 4.6 4.1 4.1 4.2 5.0 5.1 4.8 6.9 4.2 6.9 5.0 4.9 6.3 5.6 5.6 5.9 5.1
6.7 7.4 7.7 6.4 6.5 5.0 4.6 4.5 5.0 5.3 5.8 5.4 5.7 7.2 6.9 7.3 7.6 4.8 4.7 4.5 4.2 4.4 4.7 4.3 5.2 4.4 6.6 6.5 7.6 6.2 6.9 7.1
4.0 4.6 5.9 4.8 5.5 4.7 4.4 4.5 5.2 5.8 5.6 5.9 5.9 5.0 5.3 6.0 4.7 4.0 4.3 4.1 4.0 3.5 3.6 3.6 3.8 4.3 5.1 5.4 3.5 6.0 5.5 6.4 5.6
6.3 4.6 4.7 4.8 5.9 5.3 5.4 5.1 4.9 5.3 5.2 5.3 5.6 6.0 4.6 4.8 4.6 4.7 4.2 4.0 3.6 4.1 4.1 4.6 5.2 6.1 5.6 5.8 7.1 7.4 5.4 8.3 6.2
6.8 5.0 4.7 5.0 5.3 5.5 5.6 4.7 5.4 5.6 5.0 5.1 5.4 6.3 6.0 6.3 5.6 5.0 4.8 5.4 6.1 6.1 5.3 6.1 6.2 9.4 7.4 7.6 7.9
7.7 6.0 6.4 6.3 9.4 18.1 6.1 5.2 6.8 11.6 7.3 7.6 6.7 6.8 7.0 5.6 8.3 7.0 5.6 5.7 8.4 6.9 6.3
5.7 5.4 5.8 7.7 9.4 7.2 6.1 5.7 8.1 7.9 8.6 7.1 6.1 6.7 5.6 7.1 6.6 9.6 8.3 6.0 7.2 7.7 6.8 5.6 5.7
5.4 5.0 5.0 6.5 6.6 7.0 5.4 5.4 4.9 7.6 7.0 6.6 6.8 7.7 7.2 6.7 6.1 5.7 4.5 4.9 6.6 4.7
5.8 6.2 5.9 7.6 7.2 6.6 7.3 6.6 5.1 5.8 7.1 8.5 6.7 5.6 5.4 4.6 5.4 7.9 6.8
5.7 6.2 6.8 5.6 5.3 5.7 7.0 5.9 4.9 6.1 5.8 6.6 8.7 4.3 5.0 5.2 5.5 5.6 5.2
5.7 5.0 4.1 4.9 8.5 5.9 5.6 5.4 5.4 5.8 4.9 5.2 5.2 4.4
5.1 6.0 5.9 4.7

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). AUGUST 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

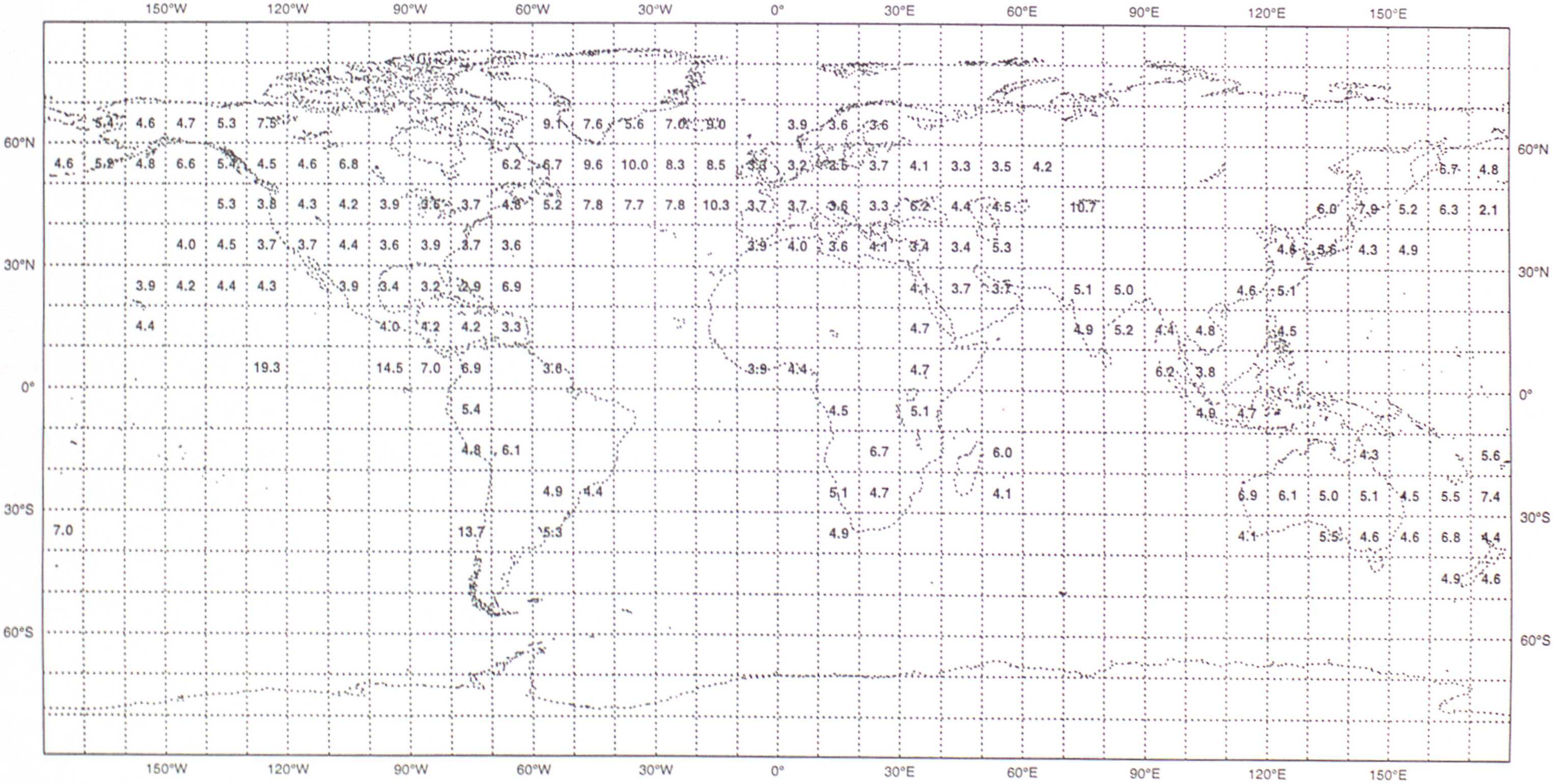

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5.4 4.6 4.7 5.3 7.5 9.1 7.6 5.6 7.0 9.0 3.9 3.6 3.6
4.6 5.9 4.8 6.6 5.4 4.5 4.6 6.8 6.2 6.7 9.6 10.0 8.3 8.5 3.3 3.2 2.5 3.7 4.1 3.3 3.5 4.2 6.7 4.8
5.3 3.8 4.3 4.2 3.9 3.6 3.7 4.8 5.2 7.8 7.7 7.8 10.3 3.7 3.7 3.6 3.3 6.2 4.4 4.5 10.7 6.0 7.9 5.2 6.3 2.1
4.0 4.5 3.7 3.7 4.4 3.6 3.9 3.7 3.6 3.9 4.0 3.6 4.1 3.4 3.4 5.3 4.6 5.6 4.3 4.9
3.9 4.2 4.4 4.3 3.9 3.4 3.2 2.9 6.9 4.1 3.7 3.7 5.1 5.0 4.6 5.1
4.4 4.0 4.2 4.2 3.3 4.7 4.9 5.2 4.4 4.8 4.5
19.3 14.5 7.0 6.9 3.8 3.9 4.4 4.7 6.2 3.8
5.4 4.5 5.1 4.9 4.7
4.8 6.1 6.7 6.0 4.3 5.6
4.9 4.4 5.1 4.7 4.1 6.9 6.1 5.0 5.1 4.5 5.5 7.4
7.0 13.7 5.3 4.9 4.1 5.5 4.6 4.6 6.8 4.4
4.9 4.6

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

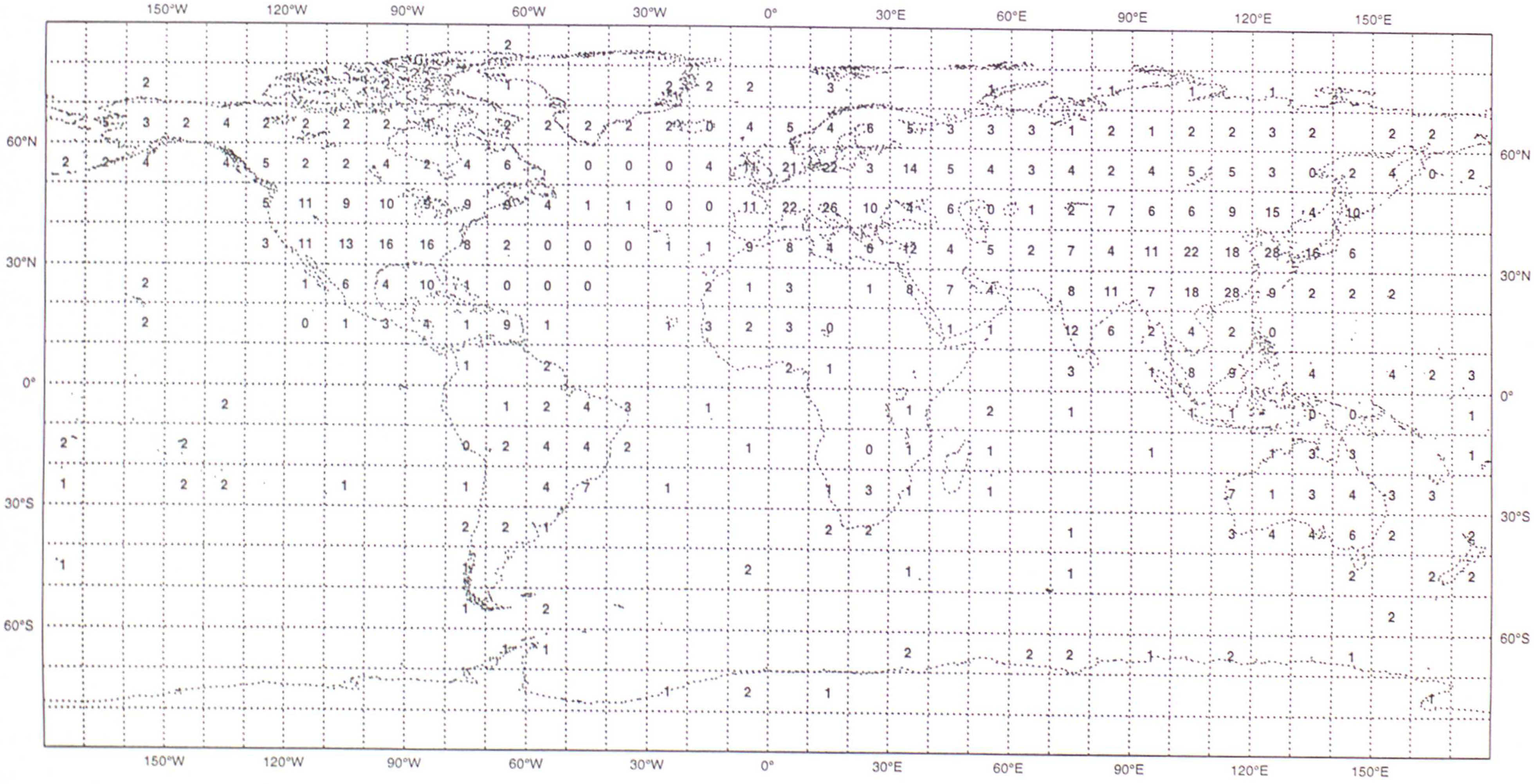
GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	12	Z	70	73/ 80	11	2	99.7	175.2	201.6	6
29612	12	Z	70	55/ 78	22	1	51.0	139.5	148.5	5
42101	00	Z	200	30/ 76	27	0	74.2	-74.6	105.2	9
42101	12	Z	50	30/ 76	22	1	162.4	172.4	236.9	8
42182	12	Z	70	29/ 77	12	1	152.5	90.7	177.4	6
42339	00	Z	150	26/ 73	15	0	106.6	42.5	114.7	4
42361	00	Z	100	26/ 78	14	0	119.6	21.6	121.6	7
42361	12	Z	400	26/ 78	13	1	76.6	-24.2	80.3	6
42369	00	Z	1000	27/ 81	1	21	0.0	-71.0	71.0	5
42369	12	Z	200	27/ 81	17	0	85.5	-42.8	95.7	6
42379	00	Z	200	27/ 83	16	0	50.9	-97.2	109.7	6
42379	12	Z	300	27/ 83	10	0	47.4	-111.0	120.7	5
42397	12	Z	100	27/ 88	10	0	108.8	30.0	112.8	4
42647	00	Z	1000	23/ 73	19	0	15.4	-41.5	44.3	6
42647	12	Z	1000	23/ 73	26	0	15.4	-53.9	56.0	7
42667	12	Z	250	23/ 77	14	0	68.5	-44.4	81.6	4
42701	00	Z	200	23/ 85	19	0	69.1	-56.7	89.4	6
42701	12	Z	50	23/ 85	11	0	102.0	103.5	145.3	4
42724	00	Z	250	24/ 91	20	0	77.6	24.1	81.2	6
42809	12	Z	70	23/ 88	21	0	84.2	125.1	150.8	4
42971	00	Z	1000	20/ 86	22	0	14.1	-58.0	59.7	4
43003	00	Z	1000	19/ 73	10	15	5.2	-92.2	92.3	6
43003	12	Z	1000	19/ 73	13	16	4.4	-92.7	92.8	9
43014	00	Z	150	20/ 75	12	3	74.0	157.8	174.3	7
43014	12	Z	200	20/ 75	20	1	70.6	108.8	129.7	6
43128	00	Z	200	17/ 78	25	0	73.3	-54.6	91.4	4
43128	12	Z	30	17/ 78	11	0	90.7	170.8	193.4	5
43185	00	Z	70	16/ 81	18	0	142.2	92.9	169.9	6
43185	12	Z	70	16/ 81	20	0	142.8	153.6	209.7	8
43192	00	Z	150	15/ 74	24	0	60.4	-120.4	134.7	8
43295	00	Z	150	13/ 78	12	0	90.9	-56.9	107.2	4
43311	00	Z	200	11/ 73	15	1	91.1	-96.8	132.9	4
43311	12	Z	150	11/ 73	10	1	111.2	-106.0	153.6	6
43333	12	Z	300	12/ 93	22	0	72.0	-40.0	82.3	7
43346	00	Z	50	11/ 80	18	0	104.3	174.1	203.0	6
43346	12	Z	100	11/ 80	14	1	87.9	133.1	159.6	7
43353	00	Z	1000	10/ 76	10	7	7.4	-84.8	85.1	5
43369	00	Z	150	8/ 73	16	0	90.0	70.0	114.0	5
43371	00	Z	50	8/ 77	15	0	159.1	-19.6	160.3	5
47058	00	Z	1000	39/ 126	15	10	19.6	-64.1	67.1	4
58968	00	Z	1000	25/ 122	7	19	3.2	-86.4	86.5	5
61902	12	Z	1000	-8/ -14	19	0	3.5	67.2	67.2	8
89592	00	Z	70	-67/ 93	15	4	107.8	169.1	200.6	7
89592	12	Z	50	-67/ 93	5	5	82.5	269.4	281.8	7

Figure 8. TEMP 500 hPa geopotential mean daily count. AUGUST 2003
All hours
Global average number of observations in 24 hours = 1097


150°W
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60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

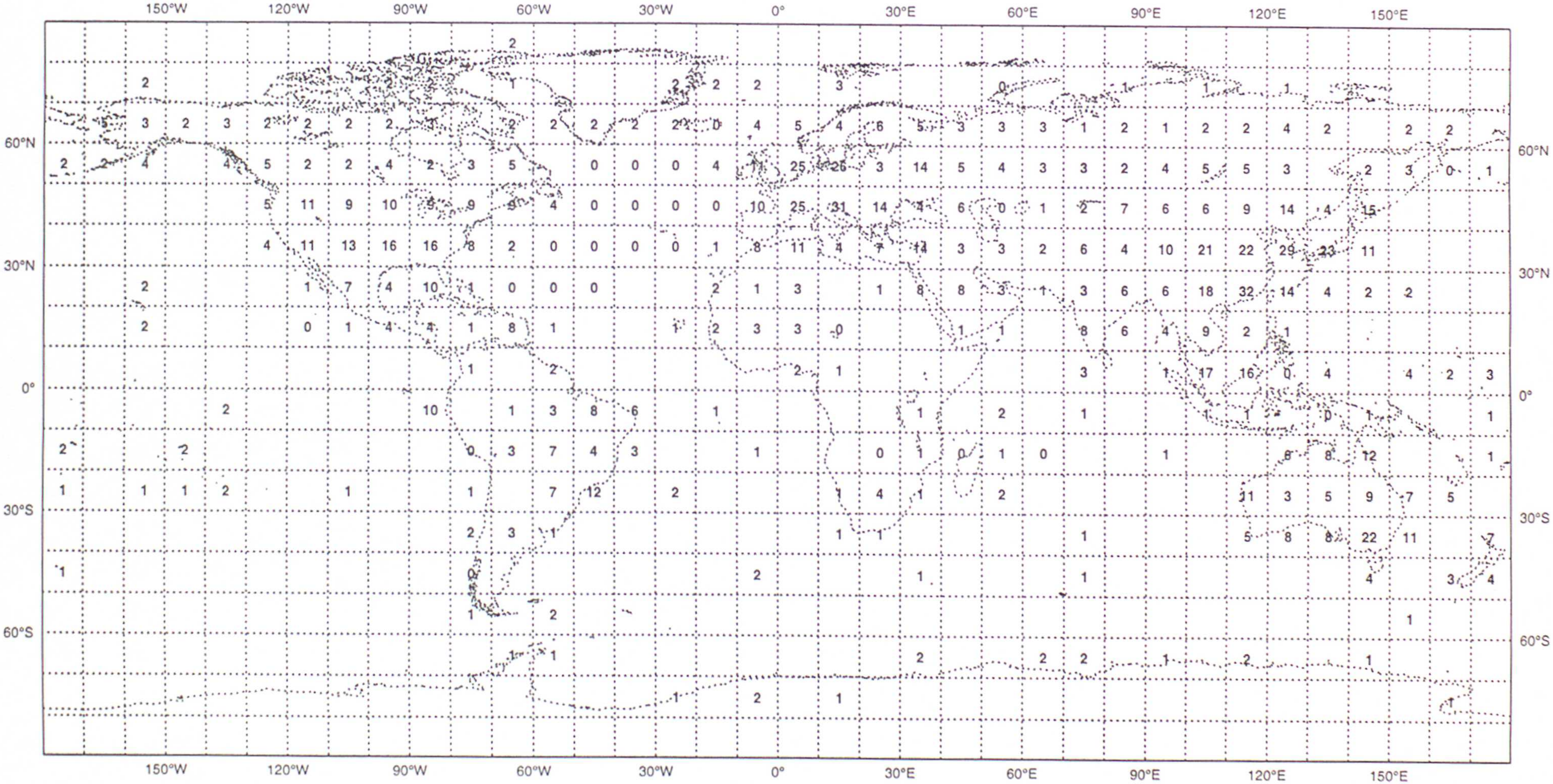
GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
43333	12	V	300	12/ 93	10	0	100	-1.5	-5.8	17.1	1
43346	12	V	300	11/ 80	11	0	9	2.5	3.7	17.1	1
43371	12	V	150	8/ 77	15	0	13	1.4	6.5	22.9	2
47058	00	V	300	39/ 126	20	0	100	-5.8	0.7	21.8	3
60559	12	V	250	33/ 7	11	0	100	-11.2	1.0	17.9	1
60566	12	V	150	32/ 4	12	0	100	-11.2	-5.2	19.6	3
63741	00	V	100	-1/ 37	23	0	21	10.5	0.4	15.5	1
63985	00	V	150	-5/ 55	25	0	24	-9.3	-3.9	16.4	1
63985	12	V	150	-5/ 55	24	0	20	-11.1	-5.3	16.5	1
64500	12	V	150	0/ 9	23	0	100	11.1	4.6	15.7	1
68174	12	V	200	-24/ 29	10	0	100	-12.4	-0.6	16.7	1
68263	12	V	250	-26/ 28	10	0	30	-8.7	1.5	17.0	2
68442	12	V	250	-29/ 26	13	0	100	-24.7	-4.4	32.3	3
68512	12	V	250	-30/ 18	15	0	100	-17.9	-0.4	25.3	5
68842	12	V	300	-34/ 26	10	0	10	-12.4	2.4	15.3	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. AUGUST 2003
All hours
Global average number of observations in 24 hours = 1264


150°W
120°W
90°W
60°W
30°W
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30°E
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90°E
120°E
150°E
60°N
30°N
0°
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2
2 1 2 2 2 3 0 1 1 1
5 3 2 3 2 2 2 2 1 2 2 2 2 2 0 4 5 4 6 5 3 3 3 1 2 1 2 2 4 2 2 2
2 2 4 4 5 2 2 4 2 3 5 0 0 0 4 11 25 26 3 14 5 4 3 3 2 4 5 5 3 2 3 0 1
5 11 9 10 5 9 8 4 0 0 0 0 10 25 31 14 4 6 0 1 2 7 6 6 9 14 4 15
4 11 13 16 16 8 2 0 0 0 0 1 8 11 4 7 14 3 3 2 6 4 10 21 22 29 23 11
2 1 7 4 10 1 0 0 0 2 1 3 1 8 8 3 1 3 6 6 18 32 14 4 2 2
2 0 1 4 4 1 8 1 1 2 3 3 0 1 1 8 6 4 9 2 1
1 2 2 1 3 1 17 16 0 4 4 2 3
2 10 1 3 8 6 1 1 2 1 1
2 2 0 3 7 4 3 1 0 1 0 1 0 1 8 8 12 1
1 1 1 2 1 1 7 12 2 1 4 1 2 11 3 5 9 7 5
2 3 1 1 1 1 5 8 8 22 11 7
1 0 2 1 1 4 3 4
1 2 1
1 1 2 2 2 1 2 1
1 2 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
42101	12	DD	30/ 76	17	12.5	9.9	19.7
43369	00	DD	8/ 73	13	13.6	5.0	15.8
48568	00	DD	7/ 101	21	10.4	5.5	21.1
59758	12	DD	20/ 110	19	11.8	5.4	20.8
62337	00	DD	31/ 34	23	-22.8	3.6	11.9
72520	00	DD	40/ -80	25	10.8	2.6	14.4
72520	12	DD	40/ -80	25	11.1	1.5	14.9
78397	00	DD	18/ -77	5	15.3	9.3	20.4
78583	00	DD	18/ -88	13	10.3	5.5	20.8
91366	12	DD	9/ 168	14	16.1	5.4	19.4

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: Aug 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. AUGUST 2003
Global average number of observations in 24 hours = 74460

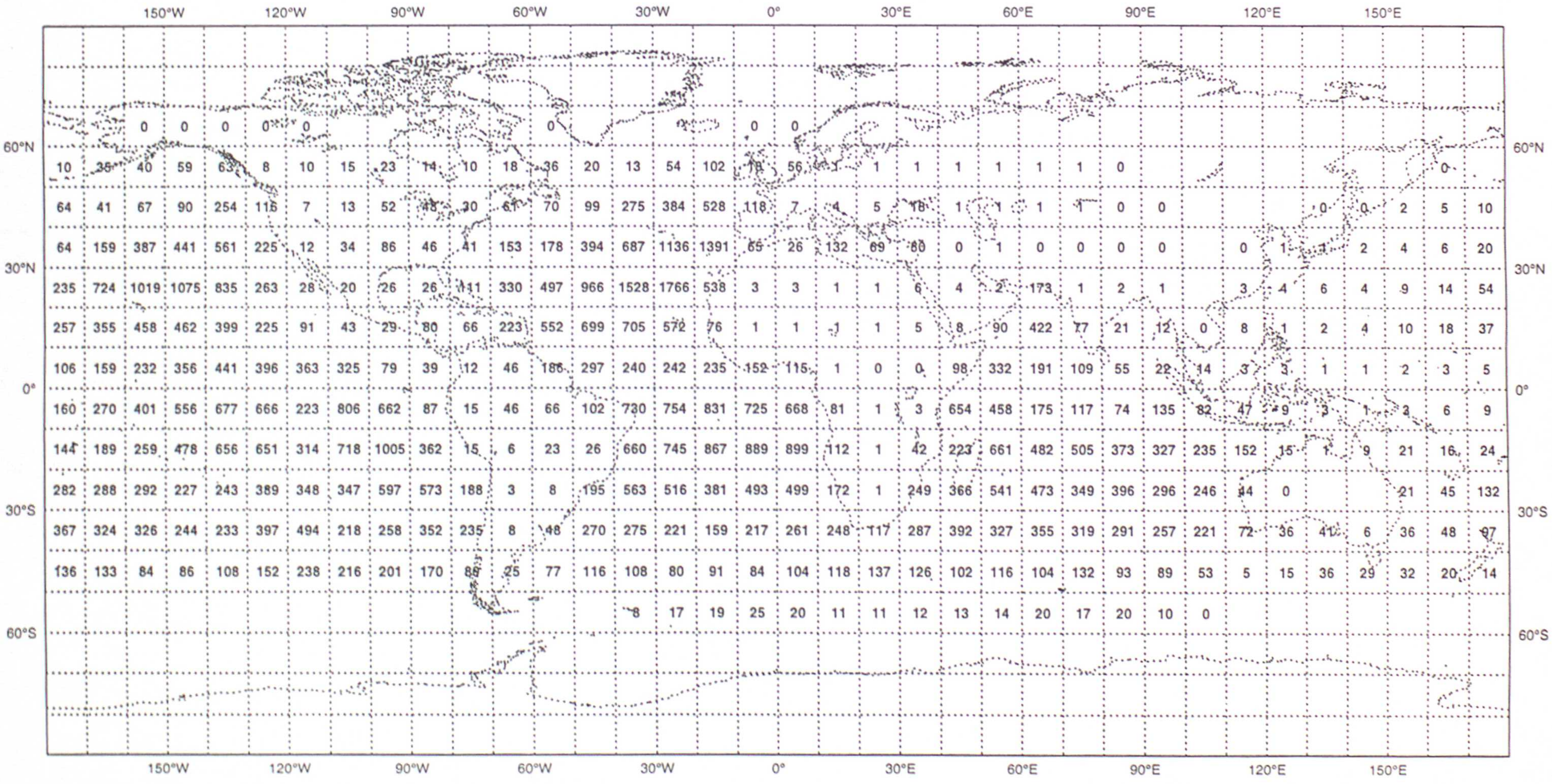

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0
10 35 40 59 63 8 10 15 23 14 10 18 36 20 13 54 102 18 56 1 1 1 1 1 1 1 0 0
64 41 67 90 254 116 7 13 52 18 30 61 70 99 275 384 528 118 7 4 5 18 1 1 1 1 0 0 0 0 2 5 10
64 159 387 441 561 225 12 34 86 46 41 153 178 394 687 1136 1391 65 26 132 69 80 0 1 0 0 0 0 0 1 1 2 4 6 20
235 724 1019 1075 835 263 28 20 26 26 111 330 497 966 1528 1766 538 3 3 1 1 6 4 2 173 1 2 1 3 4 6 4 9 14 54
257 355 458 462 399 225 91 43 29 80 66 223 552 699 705 572 76 1 1 1 1 5 8 90 422 77 21 12 0 8 1 2 4 10 18 37
106 159 232 356 441 396 363 325 79 39 12 46 186 297 240 242 235 152 115 1 0 0 98 332 191 109 55 22 14 3 3 1 1 2 3 5
160 270 401 556 677 666 223 806 662 87 15 46 66 102 730 754 831 725 668 81 1 3 654 458 175 117 74 135 82 47 9 3 1 3 6 9
144 189 259 478 656 651 314 718 1005 362 15 6 23 26 660 745 867 889 899 112 1 42 223 661 482 505 373 327 235 152 15 1 9 21 16 24
282 288 292 227 243 389 348 347 597 573 188 3 8 195 563 516 381 493 499 172 1 249 366 541 473 349 396 296 246 44 0 21 45 132
367 324 326 244 233 397 494 218 258 352 235 8 48 270 275 221 159 217 261 248 117 287 392 327 355 319 291 257 221 72 36 41 6 36 48 97
136 133 84 86 108 152 238 216 201 170 88 25 77 116 108 80 91 84 104 118 137 126 102 116 104 132 93 89 53 5 15 36 29 32 20 14
8 17 19 25 20 11 11 12 13 14 20 17 20 10 0

Figure 11. SATOB 701 - 1000 hPa vector mean wind. AUGUST 2003
All observations
Arrows are plotted where greater than 10 obs are present

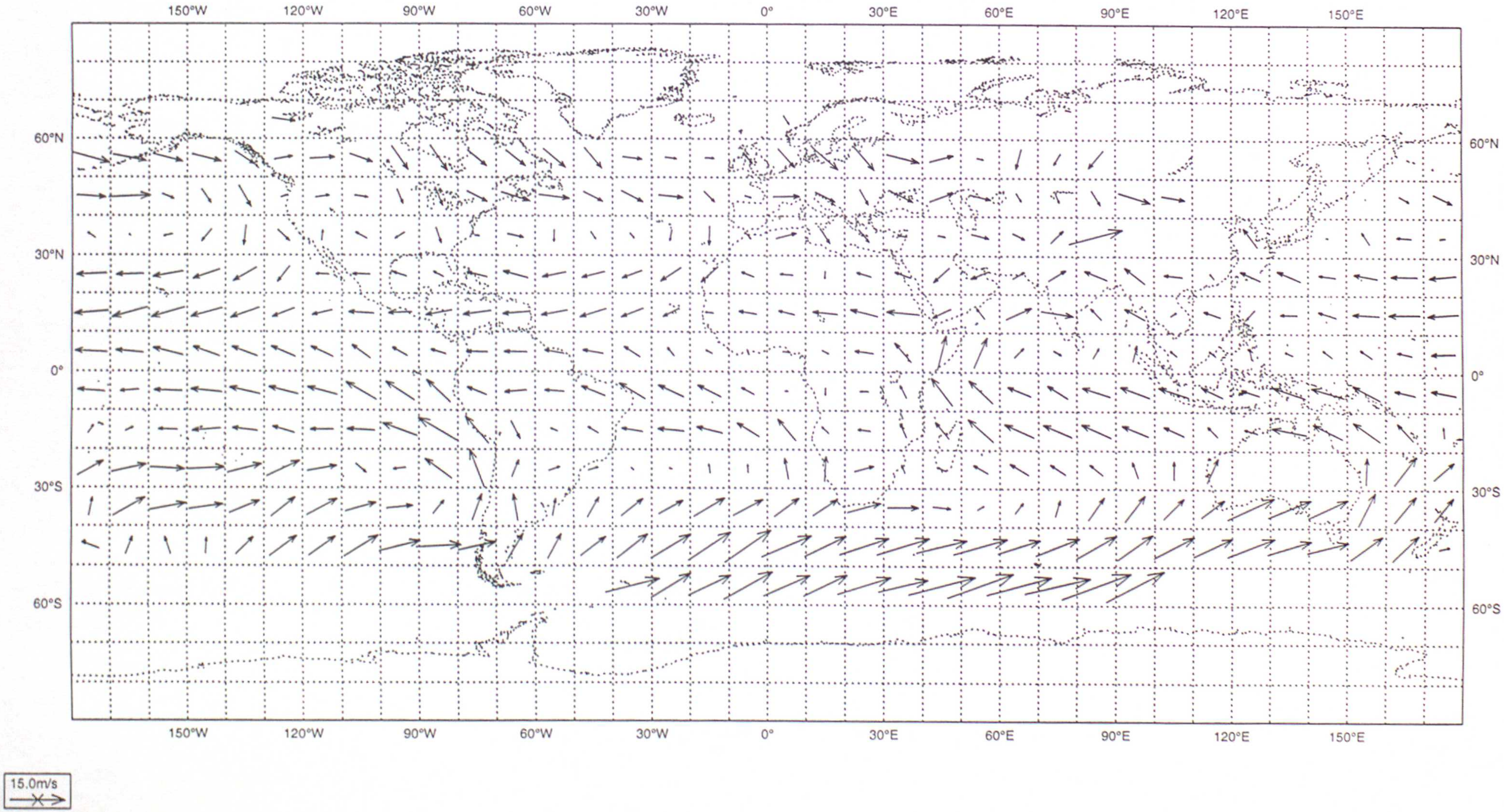

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. AUGUST 2003
All observations
Arrows are plotted where greater than 10 obs are present

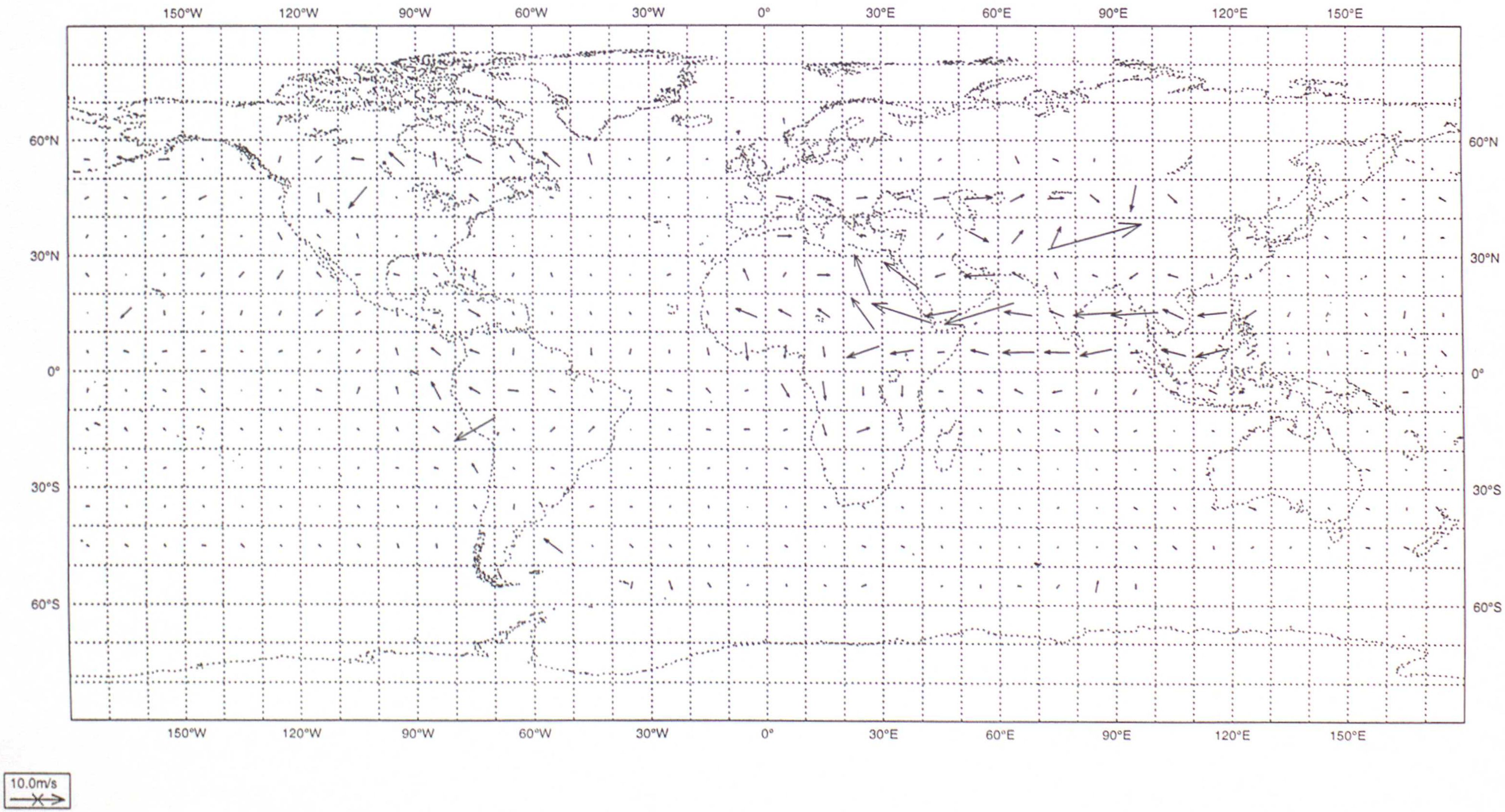

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). AUGUST 2003
All observations
Values are plotted where greater than 10 obs are present

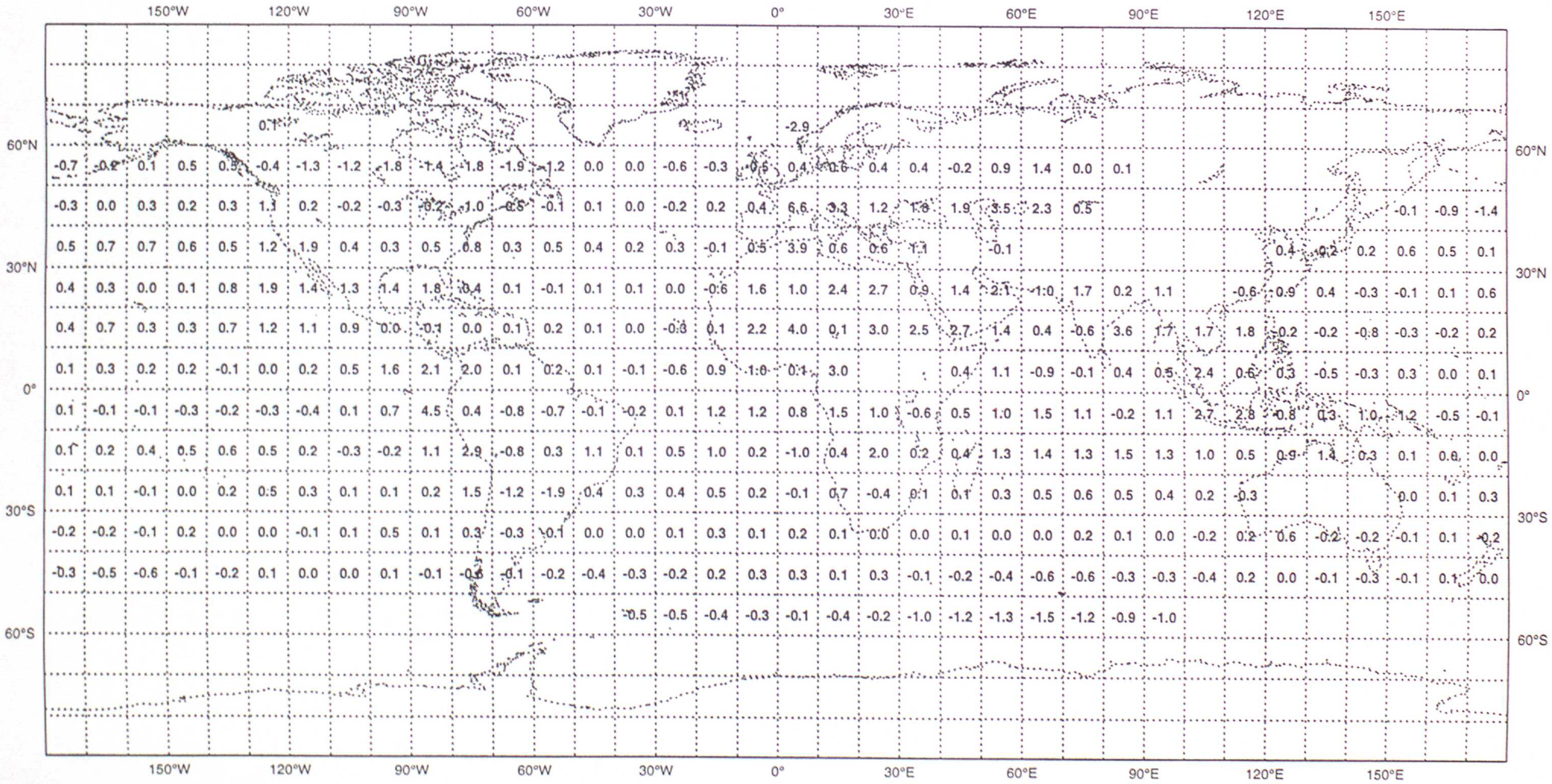

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.1
-2.9
-0.7 -0.2 0.1 0.5 0.5 -0.4 -1.3 -1.2 -1.8 -1.4 -1.8 -1.9 -1.2 0.0 0.0 -0.6 -0.3 -0.5 0.4 -0.6 0.4 0.4 -0.2 0.9 1.4 0.0 0.1
-0.3 0.0 0.3 0.2 0.3 1.1 0.2 -0.2 -0.3 -0.2 -1.0 -0.5 -0.1 0.1 0.0 -0.2 0.2 0.4 6.6 3.3 1.2 1.8 1.9 3.5 2.3 0.5 -0.1 -0.9 -1.4
0.5 0.7 0.7 0.6 0.5 1.2 1.9 0.4 0.3 0.5 0.8 0.3 0.5 0.4 0.2 0.3 -0.1 0.5 3.9 0.6 0.6 1.1 -0.1 0.4 -0.2 0.2 0.6 0.5 0.1
0.4 0.3 0.0 0.1 0.8 1.9 1.4 1.3 1.4 1.8 0.4 0.1 -0.1 0.1 0.1 0.0 -0.6 1.6 1.0 2.4 2.7 0.9 1.4 2.1 -1.0 1.7 0.2 1.1 -0.6 -0.9 0.4 -0.3 -0.1 0.1 0.6
0.4 0.7 0.3 0.3 0.7 1.2 1.1 0.9 0.0 -0.1 0.0 0.1 0.2 0.1 0.0 -0.3 0.1 2.2 4.0 0.1 3.0 2.5 2.7 1.4 0.4 -0.6 3.6 1.7 1.7 1.8 -0.2 -0.2 -0.8 -0.3 -0.2 0.2
0.1 0.3 0.2 0.2 -0.1 0.0 0.2 0.5 1.6 2.1 2.0 0.1 0.2 0.1 -0.1 -0.6 0.9 1.0 0.1 3.0 0.4 1.1 -0.9 -0.1 0.4 0.5 2.4 0.6 0.3 -0.5 -0.3 0.3 0.0 0.1
0.1 -0.1 -0.1 -0.3 -0.2 -0.3 -0.4 0.1 0.7 4.5 0.4 -0.8 -0.7 -0.1 -0.2 0.1 1.2 1.2 0.8 1.5 1.0 -0.6 0.5 1.0 1.5 1.1 -0.2 1.1 2.7 2.8 -0.8 0.3 1.0 1.2 -0.5 -0.1
0.1 0.2 0.4 0.5 0.6 0.5 0.2 -0.3 -0.2 1.1 2.9 -0.8 0.3 1.1 0.1 0.5 1.0 0.2 -1.0 0.4 2.0 0.2 0.4 1.3 1.4 1.3 1.5 1.3 1.0 0.5 0.9 1.4 0.3 0.1 0.8 0.0
0.1 0.1 -0.1 0.0 0.2 0.5 0.3 0.1 0.1 0.2 1.5 -1.2 -1.9 0.4 0.3 0.4 0.5 0.2 -0.1 0.7 -0.4 0.1 0.1 0.3 0.5 0.6 0.5 0.4 0.2 -0.3 0.0 0.1 0.3
-0.2 -0.2 -0.1 0.2 0.0 0.0 -0.1 0.1 0.5 0.1 0.3 -0.3 0.1 0.0 0.0 0.1 0.3 0.1 0.2 0.1 0.0 0.0 0.1 0.0 0.0 0.2 0.1 0.0 -0.2 0.2 0.6 -0.2 -0.2 -0.1 0.1 -0.2
-0.3 -0.5 -0.6 -0.1 -0.2 0.1 0.0 0.0 0.1 -0.1 -0.6 -0.1 -0.2 -0.4 -0.3 -0.2 0.2 0.3 0.3 0.1 0.3 -0.1 -0.2 -0.4 -0.6 -0.6 -0.3 -0.3 -0.4 0.2 0.0 -0.1 -0.3 -0.1 0.1 0.0
-0.5 -0.5 -0.4 -0.3 -0.1 -0.4 -0.2 -1.0 -1.2 -1.3 -1.5 -1.2 -0.9 -1.0

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). AUGUST 2003
All observations
Values are plotted where greater than 10 obs are present

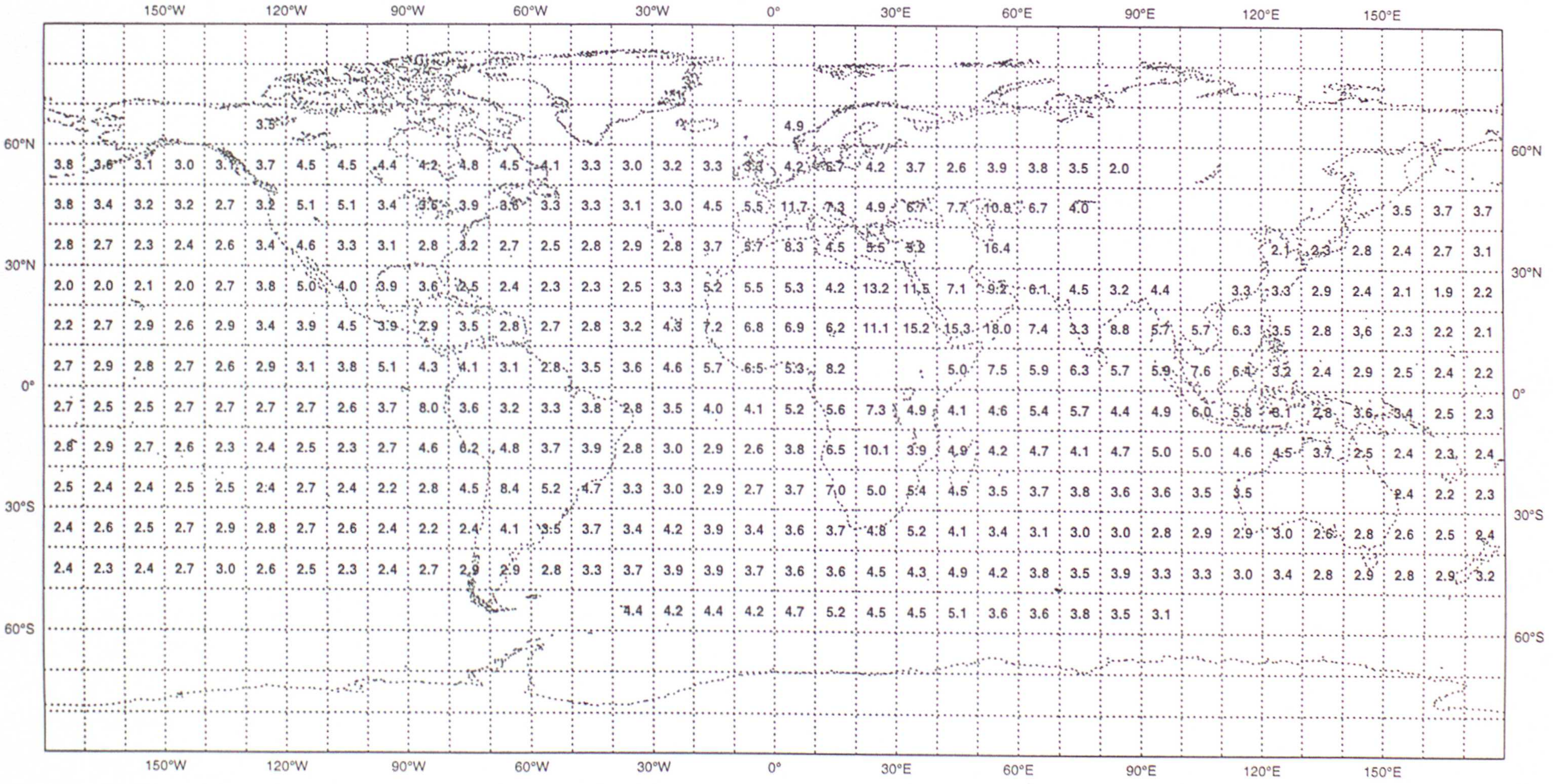

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.5
4.9
3.8 3.6 3.1 3.0 3.1 3.7 4.5 4.5 4.4 4.2 4.8 4.5 4.1 3.3 3.0 3.2 3.3 3.4 4.2 6.7 4.2 3.7 2.6 3.9 3.8 3.5 2.0
3.8 3.4 3.2 3.2 2.7 3.2 5.1 5.1 3.4 3.6 3.9 3.8 3.3 3.3 3.1 3.0 4.5 5.5 11.7 7.3 4.9 6.7 7.7 10.8 6.7 4.0 3.5 3.7 3.7
2.8 2.7 2.3 2.4 2.6 3.4 4.6 3.3 3.1 2.8 3.2 2.7 2.5 2.8 2.9 2.8 3.7 5.7 8.3 4.5 5.5 5.2 16.4 2.1 2.3 2.8 2.4 2.7 3.1
2.0 2.0 2.1 2.0 2.7 3.8 5.0 4.0 3.9 3.6 2.5 2.4 2.3 2.3 2.5 3.3 5.2 5.5 5.3 4.2 13.2 11.5 7.1 9.2 6.1 4.5 3.2 4.4 3.3 3.3 2.9 2.4 2.1 1.9 2.2
2.2 2.7 2.9 2.6 2.9 3.4 3.9 4.5 3.9 2.9 3.5 2.8 2.7 2.8 3.2 4.3 7.2 6.8 6.9 6.2 11.1 15.2 15.3 18.0 7.4 3.3 8.8 5.7 5.7 6.3 3.5 2.8 3.6 2.3 2.2 2.1
2.7 2.9 2.8 2.7 2.6 2.9 3.1 3.8 5.1 4.3 4.1 3.1 2.8 3.5 3.6 4.6 5.7 6.5 5.3 8.2 5.0 7.5 5.9 6.3 5.7 5.9 7.6 6.4 3.2 2.4 2.9 2.5 2.4 2.2
2.7 2.5 2.5 2.7 2.7 2.7 2.7 2.6 3.7 8.0 3.6 3.2 3.3 3.8 2.8 3.5 4.0 4.1 5.2 5.6 7.3 4.9 4.1 4.6 5.4 5.7 4.4 4.9 6.0 5.8 8.1 2.8 3.6 3.4 2.5 2.3
2.8 2.9 2.7 2.6 2.3 2.4 2.5 2.3 2.7 4.6 6.2 4.8 3.7 3.9 2.8 3.0 2.9 2.6 3.8 6.5 10.1 3.9 4.9 4.2 4.7 4.1 4.7 5.0 5.0 4.6 4.5 3.7 2.5 2.4 2.3 2.4
2.5 2.4 2.4 2.5 2.5 2.4 2.7 2.4 2.2 2.8 4.5 8.4 5.2 4.7 3.3 3.0 2.9 2.7 3.7 7.0 5.0 5.4 4.5 3.5 3.7 3.8 3.6 3.6 3.5 3.5 2.4 2.2 2.3
2.4 2.6 2.5 2.7 2.9 2.8 2.7 2.6 2.4 2.2 2.4 4.1 3.5 3.7 3.4 4.2 3.9 3.4 3.6 3.7 4.8 5.2 4.1 3.4 3.1 3.0 3.0 2.8 2.9 2.9 3.0 2.6 2.8 2.6 2.5 2.4
2.4 2.3 2.4 2.7 3.0 2.6 2.5 2.3 2.4 2.7 2.9 2.9 2.8 3.3 3.7 3.9 3.9 3.7 3.6 3.6 4.5 4.3 4.9 4.2 3.8 3.5 3.9 3.3 3.3 3.0 3.4 2.8 2.9 2.8 2.9 3.2
4.4 4.2 4.4 4.2 4.7 5.2 4.5 4.5 5.1 3.6 3.6 3.8 3.5 3.1

Figure 15. SATOB 401 - 700 hPa mean daily count. AUGUST 2003
Global average number of observations in 24 hours = 12019

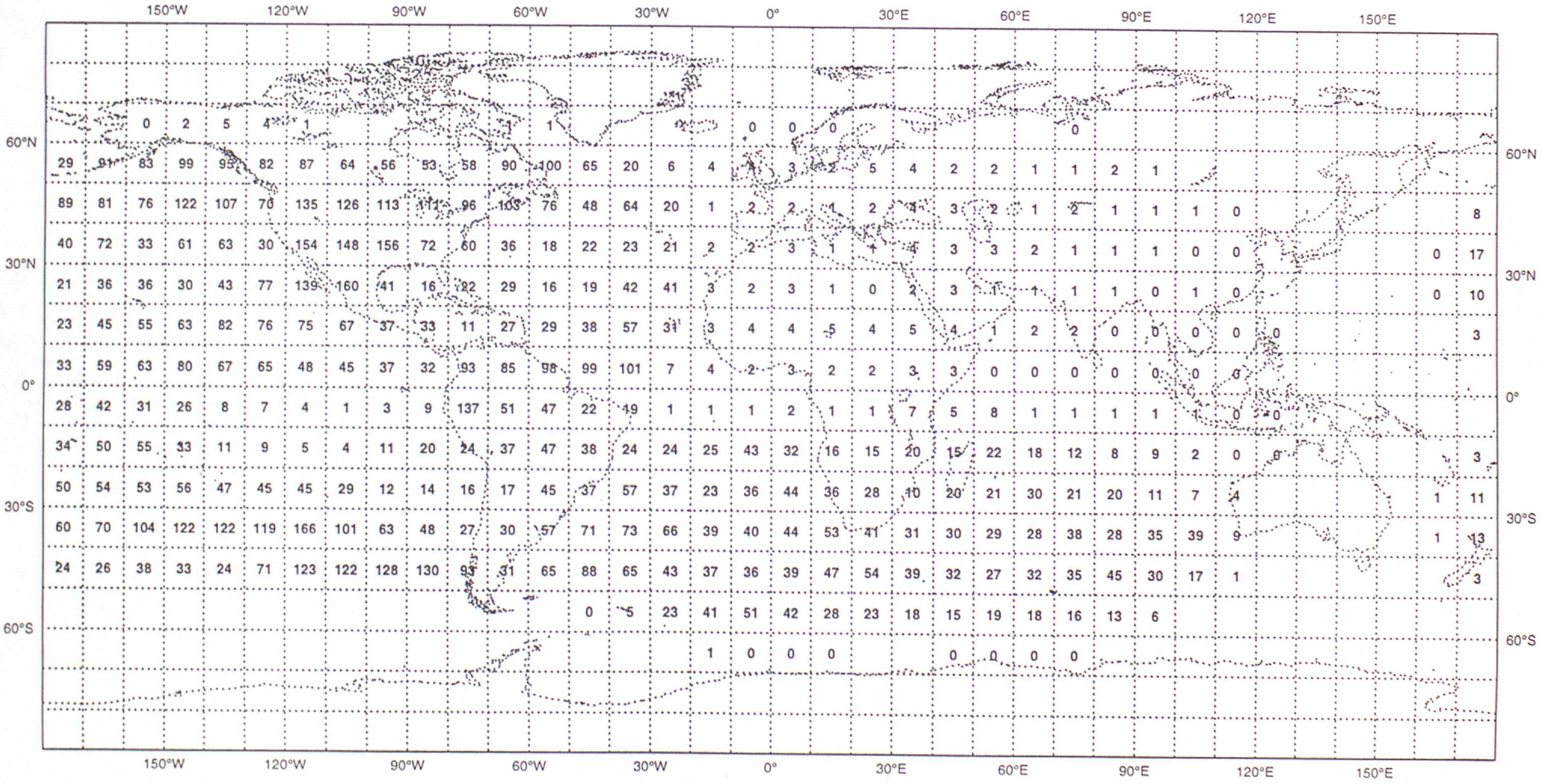

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 2 5 4 1 1 0 0 0 0
29 91 83 99 95 82 87 64 56 53 58 90 100 65 20 6 4 3 2 5 4 2 2 1 1 2 1
89 81 76 122 107 70 135 126 113 111 96 103 76 48 64 20 1 2 2 1 2 4 3 2 1 2 1 1 1 0 8
40 72 33 61 63 30 154 148 156 72 60 36 18 22 23 21 2 2 3 1 1 4 3 3 2 1 1 1 0 0 0 17
21 36 36 30 43 77 139 160 41 16 22 29 16 19 42 41 3 2 3 1 0 2 3 1 1 1 1 0 1 0 0 10
23 45 55 63 82 76 75 67 37 33 11 27 29 38 57 31 3 4 4 5 4 5 4 1 2 2 0 0 0 0 0 3
33 59 63 80 67 65 48 45 37 32 93 85 98 99 101 7 4 2 3 2 2 3 3 0 0 0 0 0 0 0
28 42 31 26 8 7 4 1 3 9 137 51 47 22 19 1 1 1 2 1 1 7 5 8 1 1 1 1 0 0
34 50 55 33 11 9 5 4 11 20 24 37 47 38 24 24 25 43 32 16 15 20 15 22 18 12 8 9 2 0 0 3
50 54 53 56 47 45 45 29 12 14 16 17 45 37 57 37 23 36 44 36 28 10 20 21 30 21 20 11 7 4 1 11
60 70 104 122 122 119 166 101 63 48 27 30 57 71 73 66 39 40 44 53 41 31 30 29 28 38 28 35 39 9 1 13
24 26 38 33 24 71 123 122 128 130 93 31 65 88 65 43 37 36 39 47 54 39 32 27 32 35 45 30 17 1 3
0 5 23 41 51 42 28 23 18 15 19 18 16 13 6
1 0 0 0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. AUGUST 2003
All observations
Arrows are plotted where greater than 10 obs are present

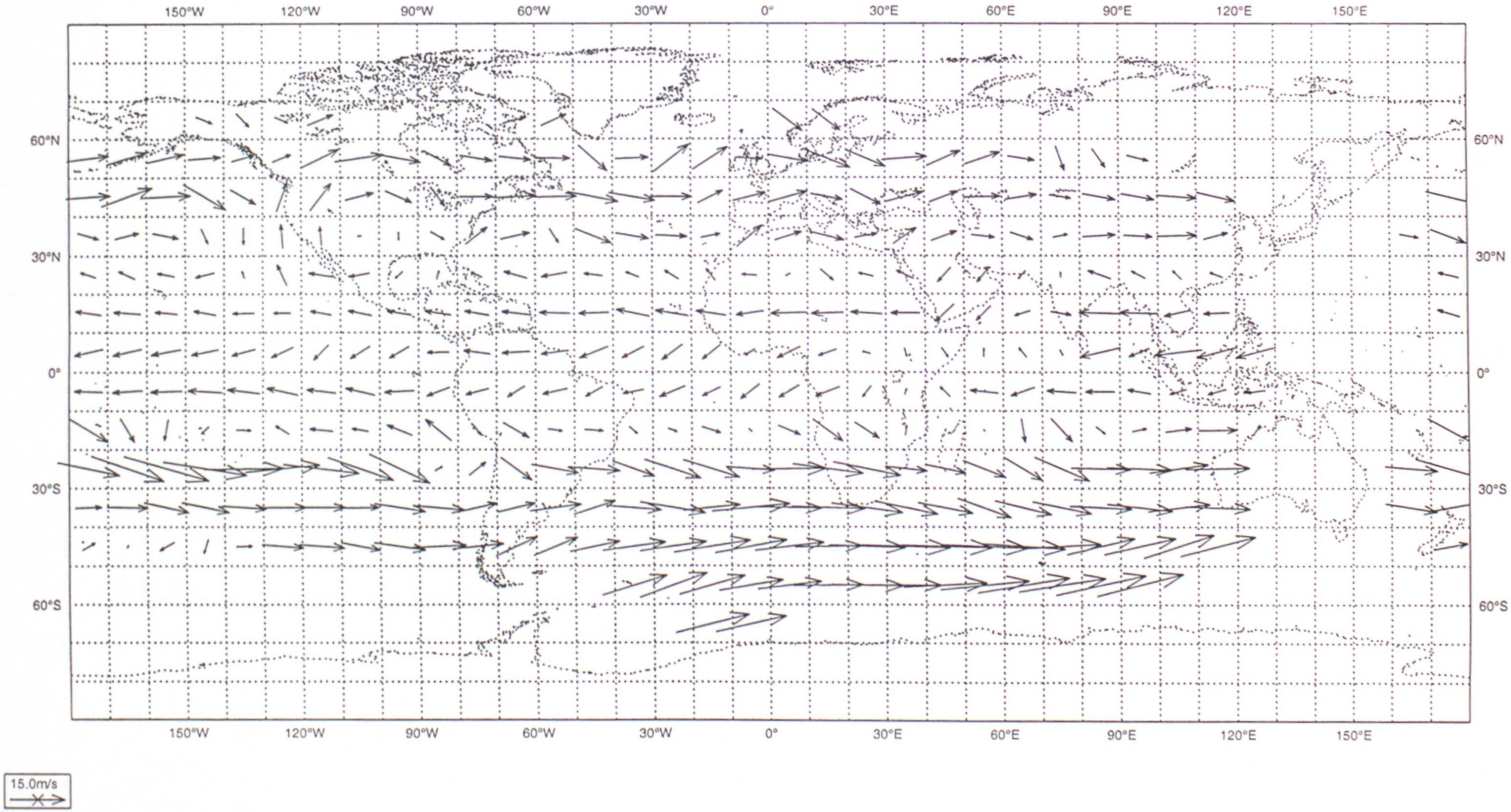

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. AUGUST 2003
All observations
Arrows are plotted where greater than 10 obs are present

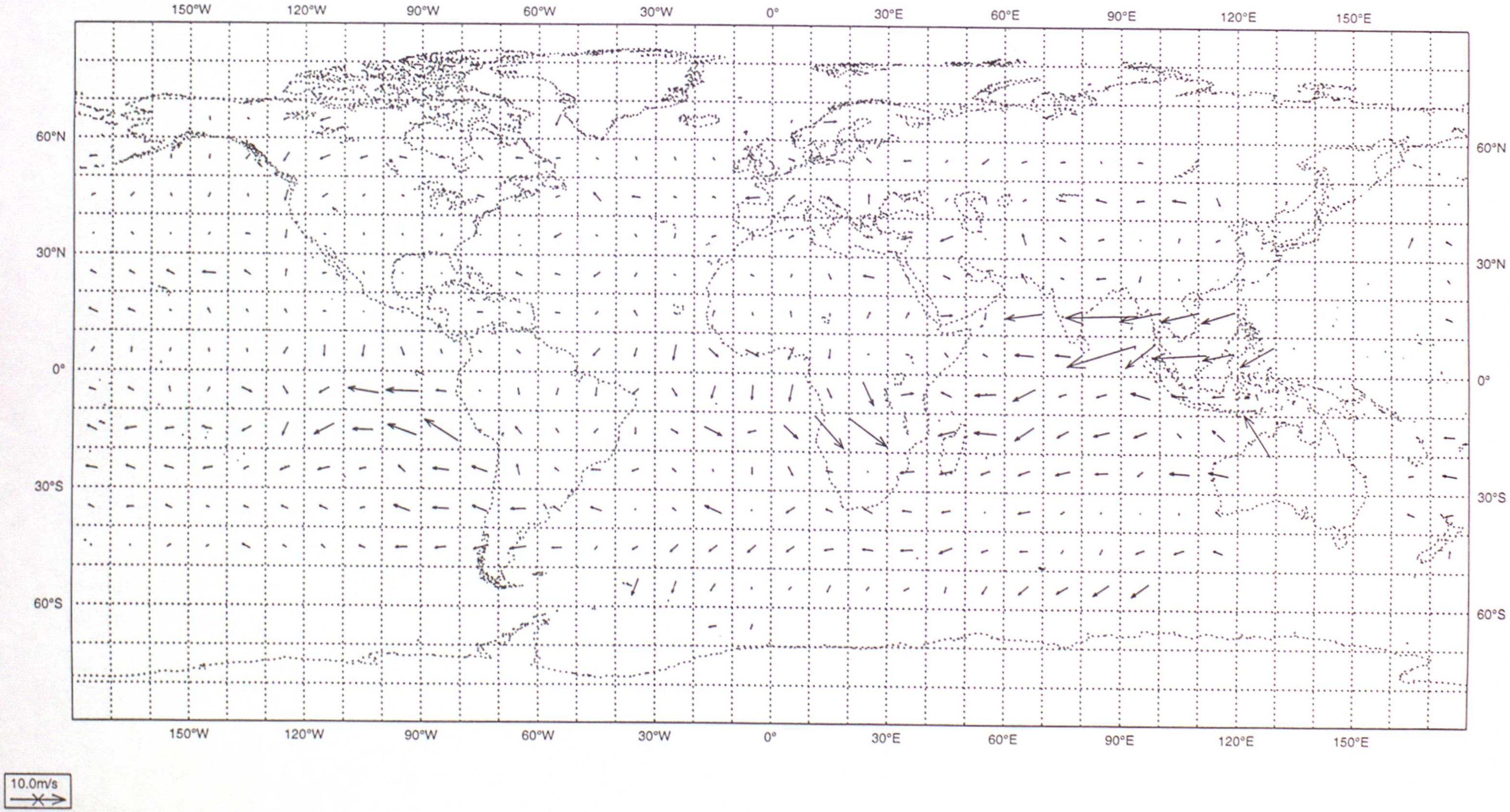

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). AUGUST 2003
All observations
Values are plotted where greater than 10 obs are present

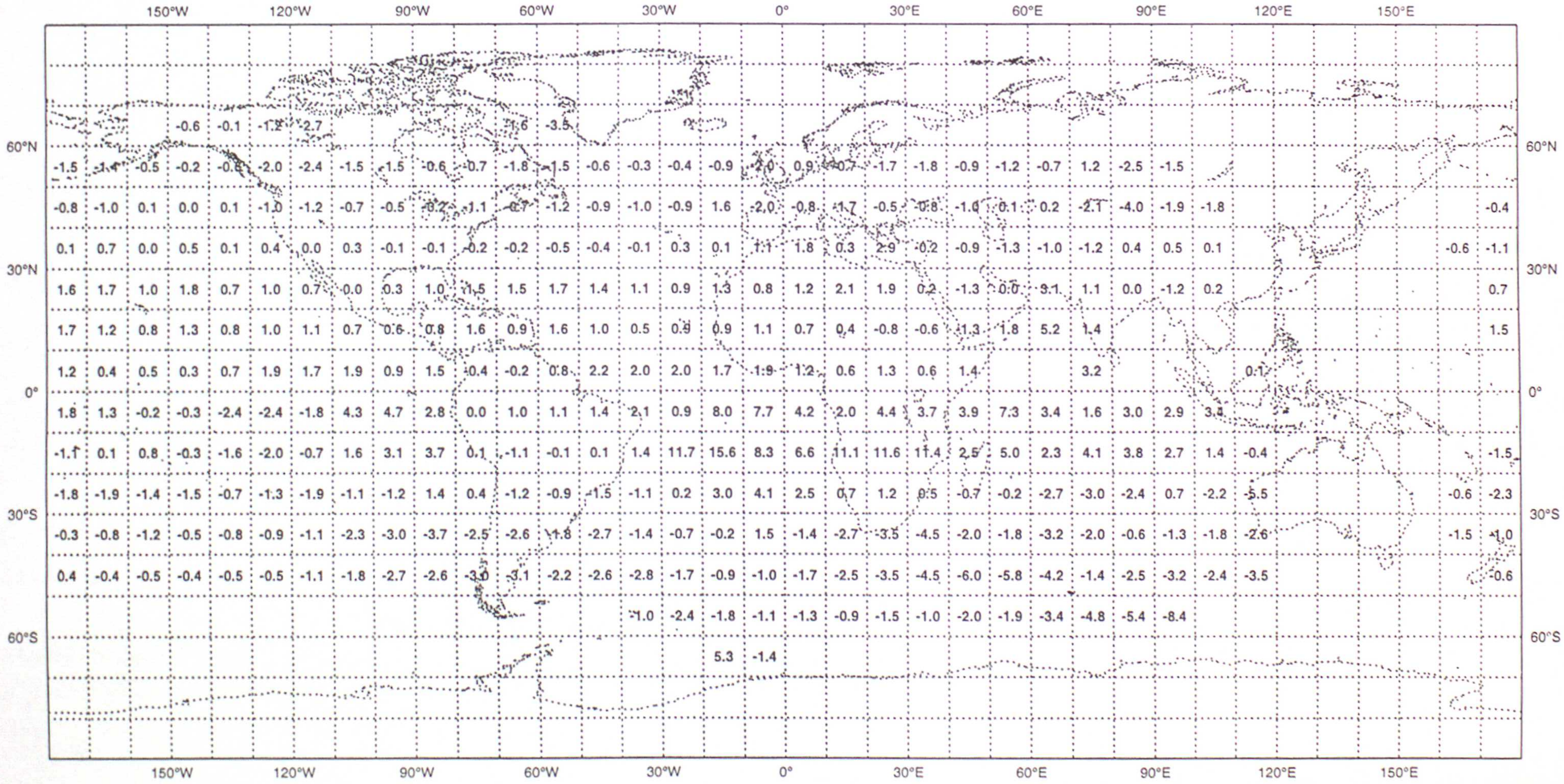

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-0.6 -0.1 -1.2 -2.7 1.6 -3.5
-1.5 -1.4 -0.5 -0.2 -0.8 -2.0 -2.4 -1.5 -1.5 -0.6 -0.7 -1.8 -1.5 -0.6 -0.3 -0.4 -0.9 -2.0 0.9 -0.7 -1.7 -1.8 -0.9 -1.2 -0.7 1.2 -2.5 -1.5
-0.8 -1.0 0.1 0.0 0.1 -1.0 -1.2 -0.7 -0.5 -0.2 -1.1 -0.7 -1.2 -0.9 -1.0 -0.9 1.6 -2.0 -0.8 -1.7 -0.5 -0.8 -1.0 0.1 0.2 -2.1 -4.0 -1.9 -1.8 -0.4
0.1 0.7 0.0 0.5 0.1 0.4 0.0 0.3 -0.1 -0.1 -0.2 -0.2 -0.5 -0.4 -0.1 0.3 0.1 1.1 1.8 0.3 2.9 -0.2 -0.9 -1.3 -1.0 -1.2 0.4 0.5 0.1 -0.6 -1.1
1.6 1.7 1.0 1.8 0.7 1.0 0.7 0.0 0.3 1.0 1.5 1.5 1.7 1.4 1.1 0.9 1.3 0.8 1.2 2.1 1.9 0.2 -1.3 0.0 3.1 1.1 0.0 -1.2 0.2 0.7
1.7 1.2 0.8 1.3 0.8 1.0 1.1 0.7 0.6 0.8 1.6 0.9 1.6 1.0 0.5 0.9 0.9 1.1 0.7 0.4 -0.8 -0.6 -1.3 1.8 5.2 1.4 1.5
1.2 0.4 0.5 0.3 0.7 1.9 1.7 1.9 0.9 1.5 -0.4 -0.2 0.8 2.2 2.0 2.0 1.7 1.9 1.2 0.6 1.3 0.6 1.4 3.2 0.1
1.8 1.3 -0.2 -0.3 -2.4 -2.4 -1.8 4.3 4.7 2.8 0.0 1.0 1.1 1.4 2.1 0.9 8.0 7.7 4.2 2.0 4.4 3.7 3.9 7.3 3.4 1.6 3.0 2.9 3.4
-1.1 0.1 0.8 -0.3 -1.6 -2.0 -0.7 1.6 3.1 3.7 0.1 -1.1 -0.1 0.1 1.4 11.7 15.6 8.3 6.6 11.1 11.6 11.4 2.5 5.0 2.3 4.1 3.8 2.7 1.4 -0.4 -1.5
-1.8 -1.9 -1.4 -1.5 -0.7 -1.3 -1.9 -1.1 -1.2 1.4 0.4 -1.2 -0.9 -1.5 -1.1 0.2 3.0 4.1 2.5 0.7 1.2 0.5 -0.7 -0.2 -2.7 -3.0 -2.4 0.7 -2.2 -5.5 -0.6 -2.3
-0.3 -0.8 -1.2 -0.5 -0.8 -0.9 -1.1 -2.3 -3.0 -3.7 -2.5 -2.6 -1.8 -2.7 -1.4 -0.7 -0.2 1.5 -1.4 -2.7 -3.5 -4.5 -2.0 -1.8 -3.2 -2.0 -0.6 -1.3 -1.8 -2.6 -1.5 -1.0
0.4 -0.4 -0.5 -0.4 -0.5 -0.5 -1.1 -1.8 -2.7 -2.6 -3.0 -3.1 -2.2 -2.6 -2.8 -1.7 -0.9 -1.0 -1.7 -2.5 -3.5 -4.5 -6.0 -5.8 -4.2 -1.4 -2.5 -3.2 -2.4 -3.5 -0.6
-1.0 -2.4 -1.8 -1.1 -1.3 -0.9 -1.5 -1.0 -2.0 -1.9 -3.4 -4.8 -5.4 -8.4
5.3 -1.4

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). AUGUST 2003
All observations
Values are plotted where greater than 10 obs are present

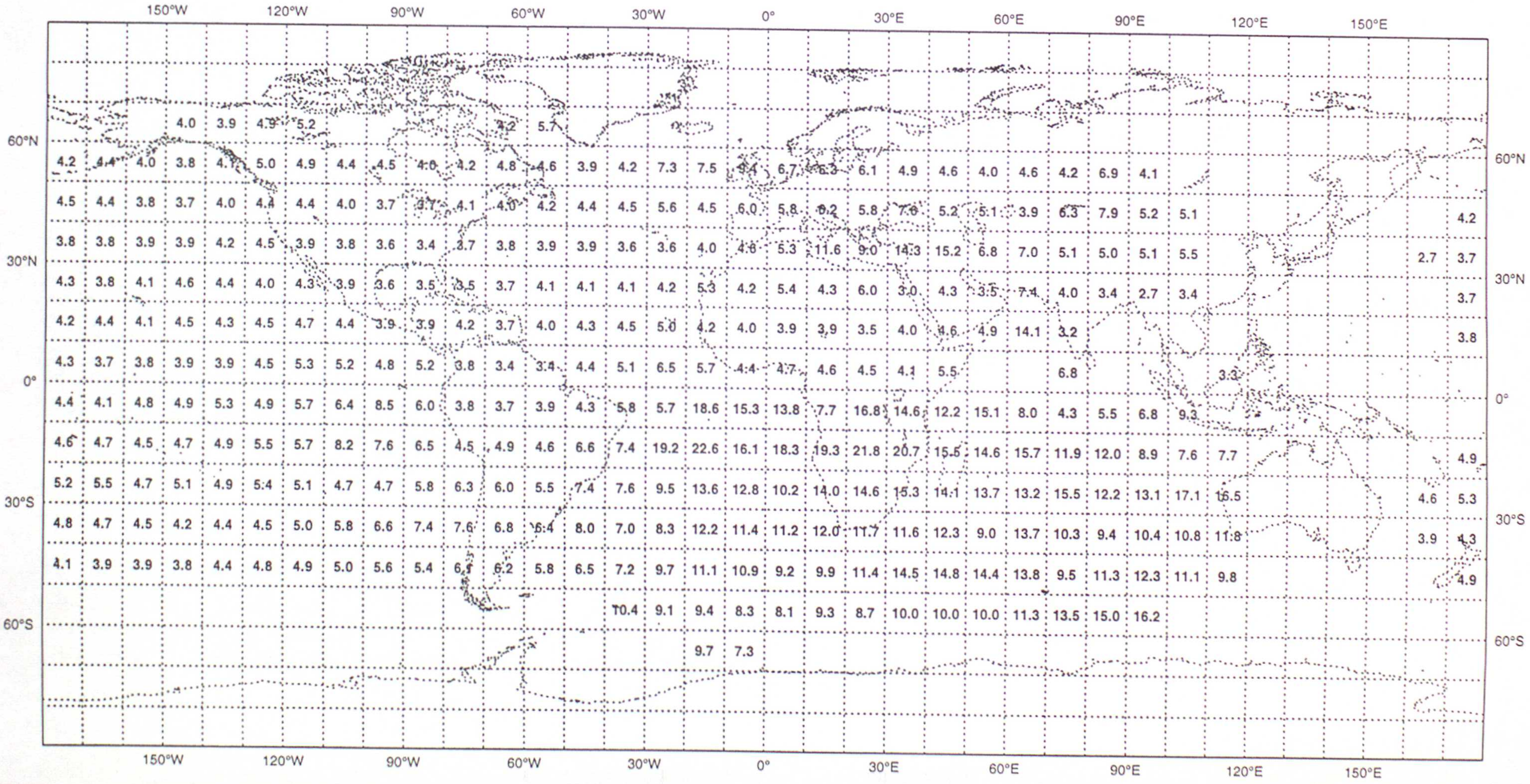
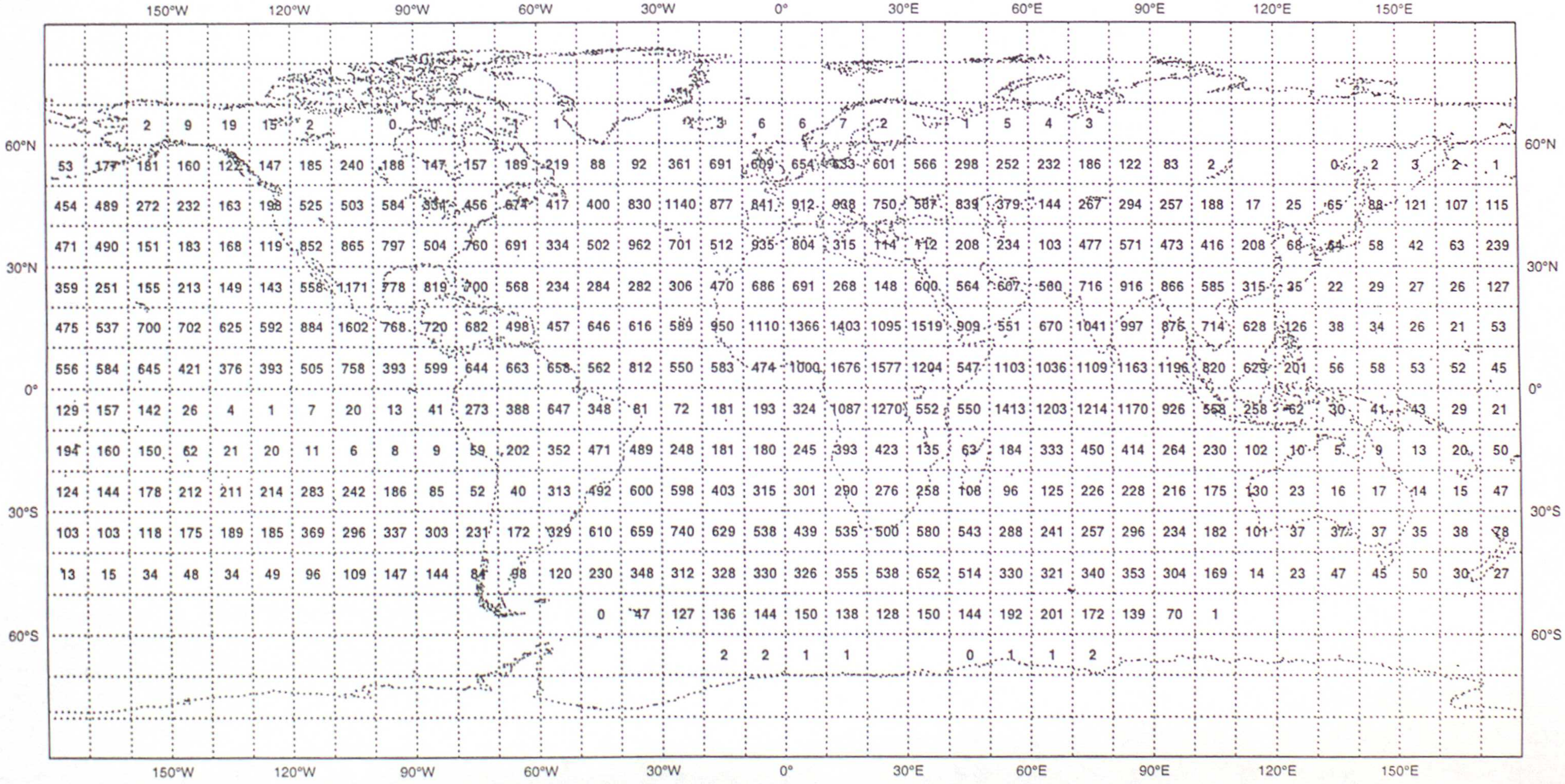

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.0 3.9 4.9 5.2 4.2 5.7
4.2 4.4 4.0 3.8 4.1 5.0 4.9 4.4 4.5 4.0 4.2 4.8 4.6 3.9 4.2 7.3 7.5 5.4 6.7 6.3 6.1 4.9 4.6 4.0 4.6 4.2 6.9 4.1
4.5 4.4 3.8 3.7 4.0 4.4 4.4 4.0 3.7 3.7 4.1 4.0 4.2 4.4 4.5 5.6 4.5 6.0 5.8 9.2 5.8 7.6 5.2 5.1 3.9 6.3 7.9 5.2 5.1 4.2
3.8 3.8 3.9 3.9 4.2 4.5 3.9 3.8 3.6 3.4 3.7 3.8 3.9 3.9 3.6 3.6 4.0 4.6 5.3 11.6 9.0 14.3 15.2 6.8 7.0 5.1 5.0 5.1 5.5 2.7 3.7
4.3 3.8 4.1 4.6 4.4 4.0 4.3 3.9 3.6 3.5 3.5 3.7 4.1 4.1 4.1 4.2 5.3 4.2 5.4 4.3 6.0 3.0 4.3 3.5 7.4 4.0 3.4 2.7 3.4 3.7
4.2 4.4 4.1 4.5 4.3 4.5 4.7 4.4 3.9 3.9 4.2 3.7 4.0 4.3 4.5 5.0 4.2 4.0 3.9 3.9 3.5 4.0 4.6 4.9 14.1 3.2 3.8
4.3 3.7 3.8 3.9 3.9 4.5 5.3 5.2 4.8 5.2 3.8 3.4 3.4 4.4 5.1 6.5 5.7 4.4 4.7 4.6 4.5 4.1 5.5 6.8 3.3
4.4 4.1 4.8 4.9 5.3 4.9 5.7 6.4 8.5 6.0 3.8 3.7 3.9 4.3 5.8 5.7 18.6 15.3 13.8 7.7 16.8 14.6 12.2 15.1 8.0 4.3 5.5 6.8 9.3
4.6 4.7 4.5 4.7 4.9 5.5 5.7 8.2 7.6 6.5 4.5 4.9 4.6 6.6 7.4 19.2 22.6 16.1 18.3 19.3 21.8 20.7 15.5 14.6 15.7 11.9 12.0 8.9 7.6 7.7 4.9
5.2 5.5 4.7 5.1 4.9 5.4 5.1 4.7 4.7 5.8 6.3 6.0 5.5 7.4 7.6 9.5 13.6 12.8 10.2 14.0 14.6 15.3 14.1 13.7 13.2 15.5 12.2 13.1 17.1 15.5 4.6 5.3
4.8 4.7 4.5 4.2 4.4 4.5 5.0 5.8 6.6 7.4 7.6 6.8 6.4 8.0 7.0 8.3 12.2 11.4 11.2 12.0 11.7 11.6 12.3 9.0 13.7 10.3 9.4 10.4 10.8 11.8 3.9 4.3
4.1 3.9 3.9 3.8 4.4 4.8 4.9 5.0 5.6 5.4 6.1 6.2 5.8 6.5 7.2 9.7 11.1 10.9 9.2 9.9 11.4 14.5 14.8 14.4 13.8 9.5 11.3 12.3 11.1 9.8 4.9
10.4 9.1 9.4 8.3 8.1 9.3 8.7 10.0 10.0 10.0 11.3 13.5 15.0 16.2
9.7 7.3

Figure 20. SATOB 101 - 400 hPa mean daily count. AUGUST 2003
Global average number of observations in 24 hours = 148269



		2	9	19	15	2		0	0		1	1				3	6	6	7	2		1	5	4	3										
53	177	181	160	122	147	185	240	188	147	157	189	219	88	92	361	691	609	654	633	601	566	298	252	232	186	122	83	2			0	2	3	2	1
454	489	272	232	163	198	525	503	584	331	456	674	417	400	830	1140	877	841	912	938	750	587	839	379	144	267	294	257	188	17	25	65	88	121	107	115
471	490	151	183	168	119	852	865	797	504	760	691	334	502	962	701	512	935	804	315	114	112	208	234	103	477	571	473	416	208	68	64	58	42	63	239
359	251	155	213	149	143	558	1171	778	819	700	568	234	284	282	306	470	686	691	268	148	600	564	607	580	716	916	866	585	315	35	22	29	27	26	127
475	537	700	702	625	592	884	1602	768	720	682	498	457	646	616	589	950	1110	1366	1403	1095	1519	909	551	670	1041	997	876	714	628	126	38	34	26	21	53
556	584	645	421	376	393	505	758	393	599	644	663	658	562	812	550	583	474	1000	1676	1577	1204	547	1103	1036	1109	1163	1196	820	629	201	56	58	53	52	45
129	157	142	26	4	1	7	20	13	41	273	388	647	348	81	72	181	193	324	1087	1270	552	550	1413	1203	1214	1170	926	558	258	62	30	41	43	29	21
194	160	150	62	21	20	11	6	8	9	59	202	352	471	489	248	181	180	245	393	423	135	63	184	333	450	414	264	230	102	10	5	9	13	20	50
124	144	178	212	211	214	283	242	186	85	52	40	313	492	600	598	403	315	301	290	276	258	108	96	125	226	228	216	175	130	23	16	17	14	15	47
103	103	118	175	189	185	369	296	337	303	231	172	329	610	659	740	629	538	439	535	500	580	543	288	241	257	296	234	182	101	37	37	37	35	38	78
13	15	34	48	34	49	96	109	147	144	84	98	120	230	348	312	328	330	326	355	538	652	514	330	321	340	353	304	169	14	23	47	45	50	30	27
													0	47	127	136	144	150	138	128	150	144	192	201	172	139	70	1							
																2	2	1	1			0	1	1	2										

Figure 21. SATOB 101 - 400 hPa vector mean wind. AUGUST 2003
All observations
Arrows are plotted where greater than 10 obs are present

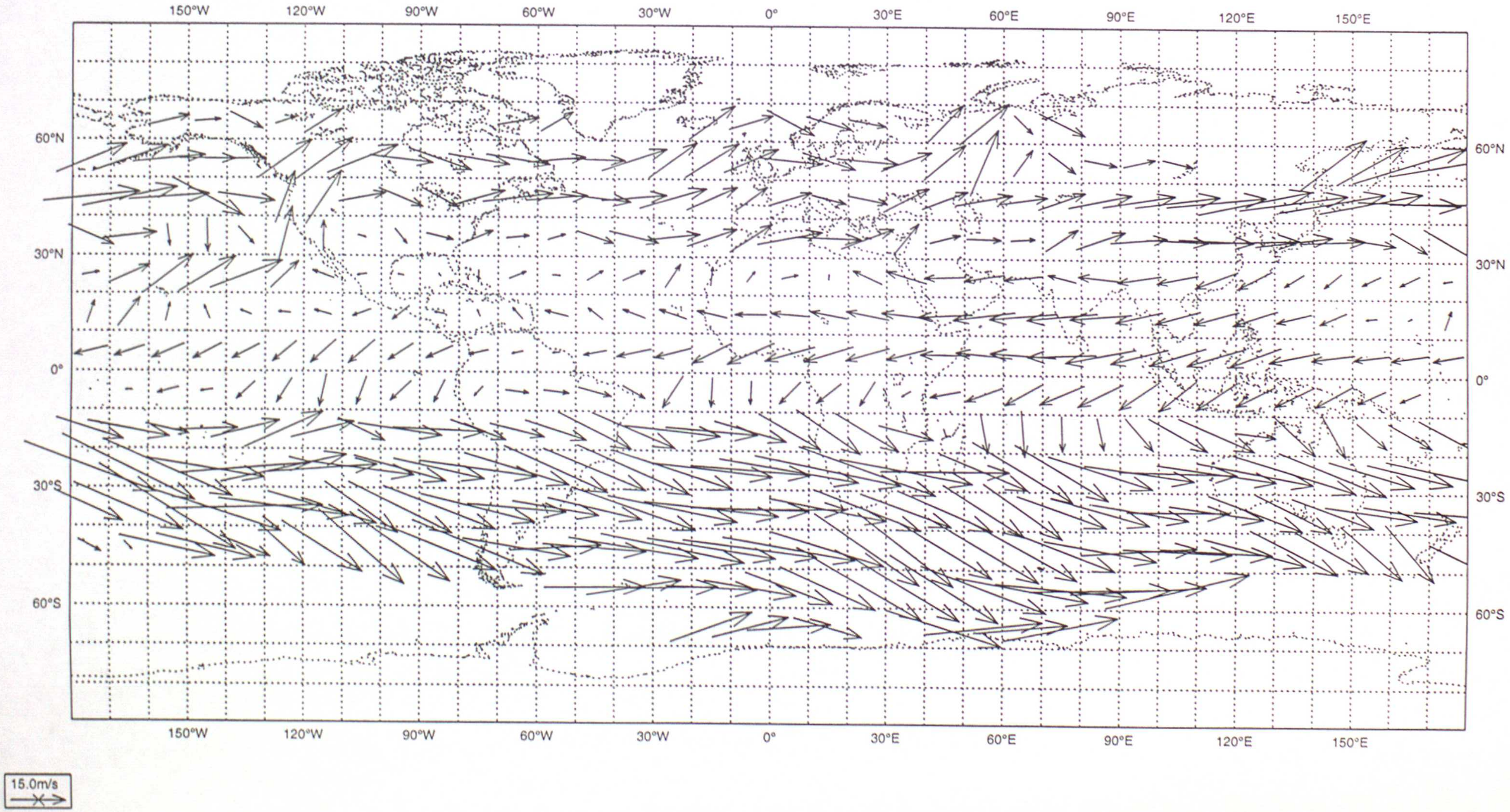

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. AUGUST 2003
All observations
Arrows are plotted where greater than 10 obs are present

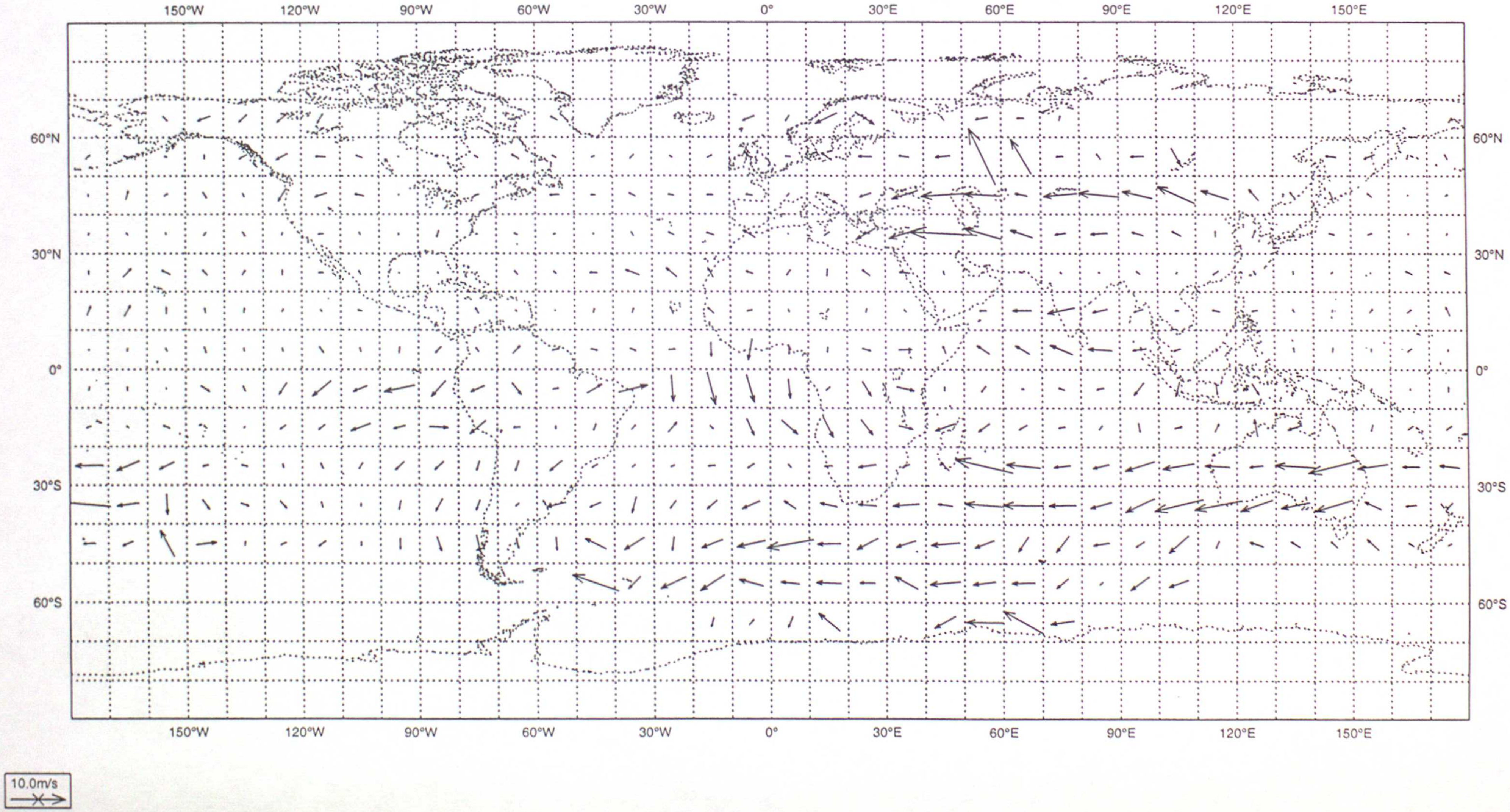

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). AUGUST 2003
All observations
Values are plotted where greater than 10 obs are present

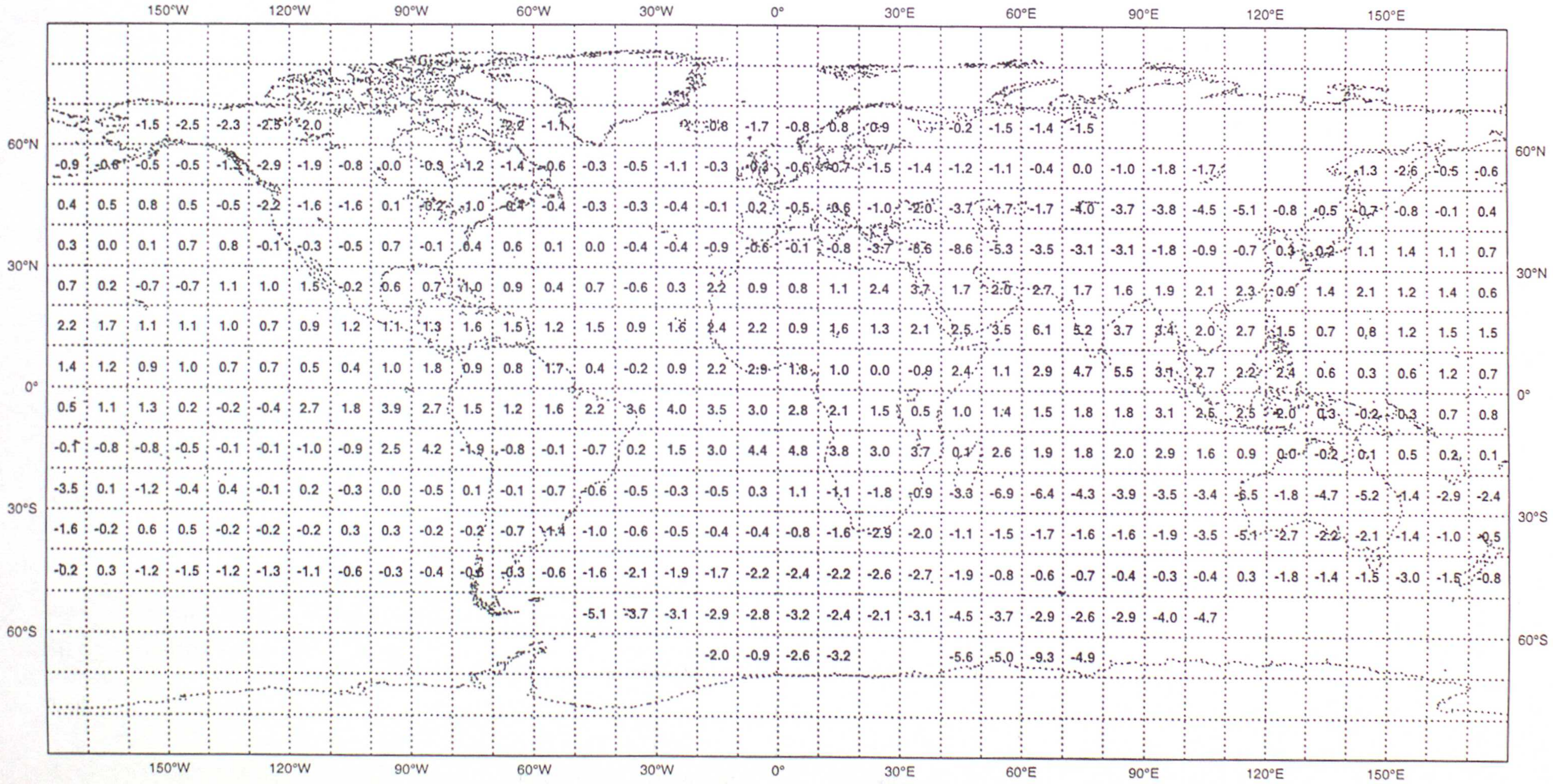
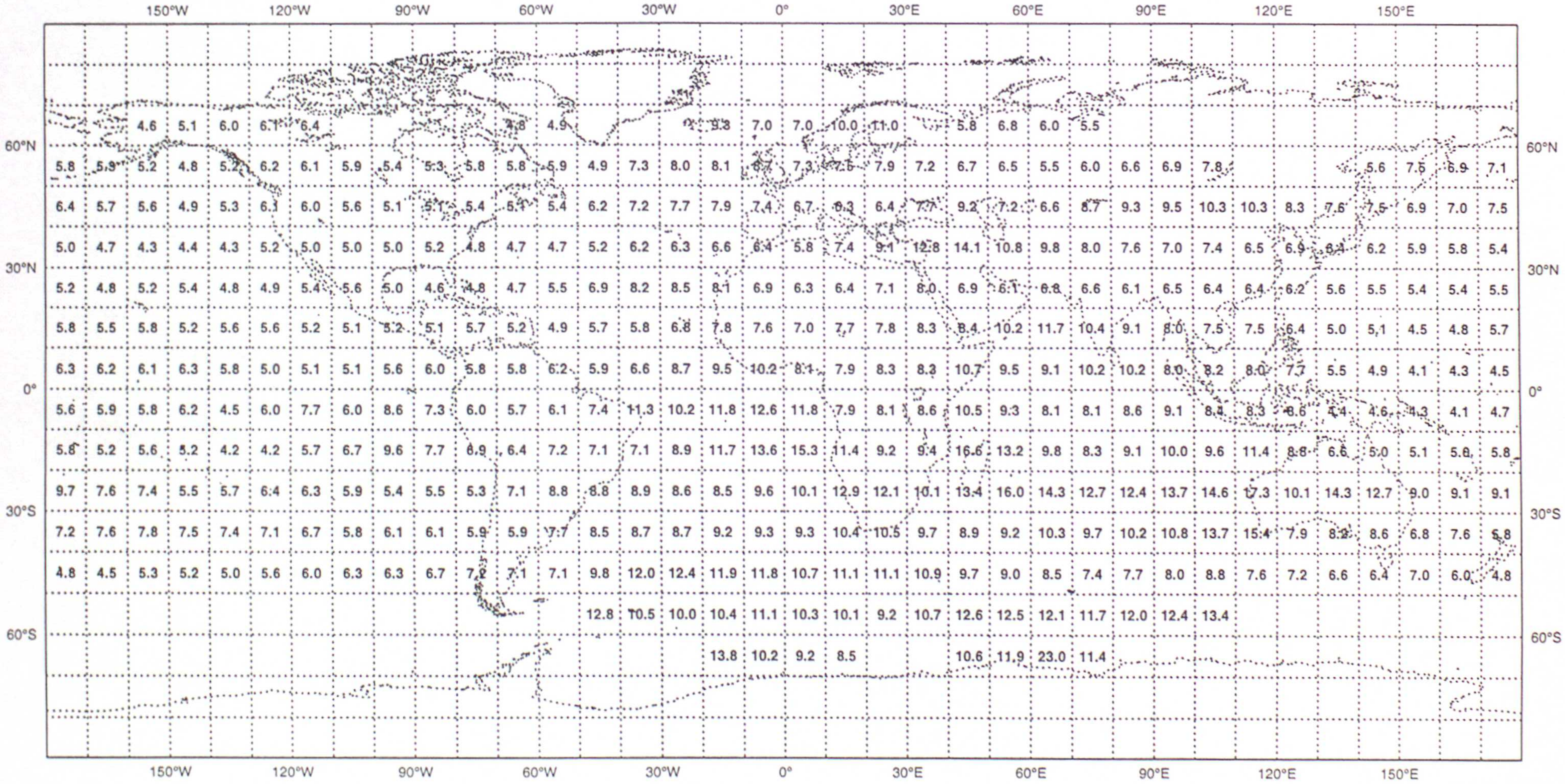

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-1.5 -2.5 -2.3 -2.5 -2.0 -2.2 -1.1 -0.8 -1.7 -0.8 0.8 0.9 -0.2 -1.5 -1.4 -1.5
-0.9 -0.6 -0.5 -0.5 -1.3 -2.9 -1.9 -0.8 0.0 -0.9 -1.2 -1.4 -0.6 -0.3 -0.5 -1.1 -0.3 -0.3 -0.6 -0.7 -1.5 -1.4 -1.2 -1.1 -0.4 0.0 -1.0 -1.8 -1.7 -1.3 -2.6 -0.5 -0.6
0.4 0.5 0.8 0.5 -0.5 -2.2 -1.6 -1.6 0.1 -0.2 -1.0 -0.4 -0.4 -0.3 -0.3 -0.4 -0.1 0.2 -0.5 -0.6 -1.0 -2.0 -3.7 -1.7 -1.7 -4.0 -3.7 -3.8 -4.5 -5.1 -0.8 -0.5 -0.7 -0.8 -0.1 0.4
0.3 0.0 0.1 0.7 0.8 -0.1 -0.3 -0.5 0.7 -0.1 0.4 0.6 0.1 0.0 -0.4 -0.4 -0.9 -0.6 -0.1 -0.8 -3.7 -8.6 -8.6 -5.3 -3.5 -3.1 -3.1 -1.8 -0.9 -0.7 0.3 0.2 1.1 1.4 1.1 0.7
0.7 0.2 -0.7 -0.7 1.1 1.0 1.5 -0.2 0.6 0.7 1.0 0.9 0.4 0.7 -0.6 0.3 2.2 0.9 0.8 1.1 2.4 3.7 1.7 2.0 2.7 1.7 1.6 1.9 2.1 2.3 0.9 1.4 2.1 1.2 1.4 0.6
2.2 1.7 1.1 1.1 1.0 0.7 0.9 1.2 1.1 1.3 1.6 1.5 1.2 1.5 0.9 1.6 2.4 2.2 0.9 1.6 1.3 2.1 2.5 3.5 6.1 5.2 3.7 3.4 2.0 2.7 1.5 0.7 0.8 1.2 1.5 1.5
1.4 1.2 0.9 1.0 0.7 0.7 0.5 0.4 1.0 1.8 0.9 0.8 1.7 0.4 -0.2 0.9 2.2 2.9 1.8 1.0 0.0 -0.9 2.4 1.1 2.9 4.7 5.5 3.1 2.7 2.2 2.4 0.6 0.3 0.6 1.2 0.7
0.5 1.1 1.3 0.2 -0.2 -0.4 2.7 1.8 3.9 2.7 1.5 1.2 1.6 2.2 3.6 4.0 3.5 3.0 2.8 2.1 1.5 0.5 1.0 1.4 1.5 1.8 1.8 3.1 2.5 2.5 2.0 0.3 -0.2 0.3 0.7 0.8
-0.1 -0.8 -0.8 -0.5 -0.1 -0.1 -1.0 -0.9 2.5 4.2 -1.9 -0.8 -0.1 -0.7 0.2 1.5 3.0 4.4 4.8 3.8 3.0 3.7 0.1 2.6 1.9 1.8 2.0 2.9 1.6 0.9 0.0 -0.2 0.1 0.5 0.2 0.1
-3.5 0.1 -1.2 -0.4 0.4 -0.1 0.2 -0.3 0.0 -0.5 0.1 -0.1 -0.7 -0.6 -0.5 -0.3 -0.5 0.3 1.1 -1.1 -1.8 -0.9 -3.3 -6.9 -6.4 -4.3 -3.9 -3.5 -3.4 -6.5 -1.8 -4.7 -5.2 -1.4 -2.9 -2.4
-1.6 -0.2 0.6 0.5 -0.2 -0.2 -0.2 0.3 0.3 -0.2 -0.2 -0.7 -1.4 -1.0 -0.6 -0.5 -0.4 -0.4 -0.8 -1.6 -2.9 -2.0 -1.1 -1.5 -1.7 -1.6 -1.6 -1.9 -3.5 -5.1 -2.7 -2.2 -2.1 -1.4 -1.0 -0.5
-0.2 0.3 -1.2 -1.5 -1.2 -1.3 -1.1 -0.6 -0.3 -0.4 -0.6 -0.3 -0.6 -1.6 -2.1 -1.9 -1.7 -2.2 -2.4 -2.2 -2.6 -2.7 -1.9 -0.8 -0.6 -0.7 -0.4 -0.3 -0.4 0.3 -1.8 -1.4 -1.5 -3.0 -1.5 -0.8
-5.1 -3.7 -3.1 -2.9 -2.8 -3.2 -2.4 -2.1 -3.1 -4.5 -3.7 -2.9 -2.6 -2.9 -4.0 -4.7
-2.0 -0.9 -2.6 -3.2 -5.6 -5.0 -9.3 -4.9

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). AUGUST 2003
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.6 5.1 6.0 6.1 6.4 4.8 4.9 9.3 7.0 7.0 10.0 11.0 5.8 6.8 6.0 5.5
5.8 5.9 5.2 4.8 5.2 6.2 6.1 5.9 5.4 5.3 5.8 5.8 5.9 4.9 7.3 8.0 8.1 8.7 7.3 7.5 7.9 7.2 6.7 6.5 5.5 6.0 6.6 6.9 7.8 5.6 7.5 6.9 7.1
6.4 5.7 5.6 4.9 5.3 6.1 6.0 5.6 5.1 5.1 5.4 5.1 5.4 6.2 7.2 7.7 7.9 7.4 6.7 8.3 6.4 7.7 9.2 7.2 6.6 8.7 9.3 9.5 10.3 10.3 8.3 7.6 7.5 6.9 7.0 7.5
5.0 4.7 4.3 4.4 4.3 5.2 5.0 5.0 5.0 5.2 4.8 4.7 4.7 5.2 6.2 6.3 6.6 6.4 5.8 7.4 9.1 12.8 14.1 10.8 9.8 8.0 7.6 7.0 7.4 6.5 6.9 6.4 6.2 5.9 5.8 5.4
5.2 4.8 5.2 5.4 4.8 4.9 5.4 5.6 5.0 4.6 4.8 4.7 5.5 6.9 8.2 8.5 8.1 6.9 6.3 6.4 7.1 8.0 6.9 6.1 6.8 6.6 6.1 6.5 6.4 6.4 6.2 5.6 5.5 5.4 5.4 5.5
5.8 5.5 5.8 5.2 5.6 5.6 5.2 5.1 5.2 5.1 5.7 5.2 4.9 5.7 5.8 6.8 7.8 7.6 7.0 7.7 7.8 8.3 8.4 10.2 11.7 10.4 9.1 8.0 7.5 7.5 6.4 5.0 5.1 4.5 4.8 5.7
6.3 6.2 6.1 6.3 5.8 5.0 5.1 5.1 5.6 6.0 5.8 5.8 6.2 5.9 6.6 8.7 9.5 10.2 8.1 7.9 8.3 8.3 10.7 9.5 9.1 10.2 10.2 8.0 8.2 8.0 7.7 5.5 4.9 4.1 4.3 4.5
5.6 5.9 5.8 6.2 4.5 6.0 7.7 6.0 8.6 7.3 6.0 5.7 6.1 7.4 11.3 10.2 11.8 12.6 11.8 7.9 8.1 8.6 10.5 9.3 8.1 8.1 8.6 9.1 8.4 8.3 8.6 4.4 4.6 4.3 4.1 4.7
5.8 5.2 5.6 5.2 4.2 4.2 5.7 6.7 9.6 7.7 6.9 6.4 7.2 7.1 7.1 8.9 11.7 13.6 15.3 11.4 9.2 9.4 16.6 13.2 9.8 8.3 9.1 10.0 9.6 11.4 8.8 6.6 5.0 5.1 5.8 5.8
9.7 7.6 7.4 5.5 5.7 6.4 6.3 5.9 5.4 5.5 5.3 7.1 8.8 8.8 8.9 8.6 8.5 9.6 10.1 12.9 12.1 10.1 13.4 16.0 14.3 12.7 12.4 13.7 14.6 17.3 10.1 14.3 12.7 9.0 9.1 9.1
7.2 7.6 7.8 7.5 7.4 7.1 6.7 5.8 6.1 6.1 5.9 5.9 7.7 8.5 8.7 8.7 9.2 9.3 9.3 10.4 10.5 9.7 8.9 9.2 10.3 9.7 10.2 10.8 13.7 15.4 7.9 8.2 8.6 6.8 7.6 5.8
4.8 4.5 5.3 5.2 5.0 5.6 6.0 6.3 6.3 6.7 7.2 7.1 7.1 9.8 12.0 12.4 11.9 11.8 10.7 11.1 11.1 10.9 9.7 9.0 8.5 7.4 7.7 8.0 8.8 7.6 7.2 6.6 6.4 7.0 6.0 4.8
12.8 10.5 10.0 10.4 11.1 10.3 10.1 9.2 10.7 12.6 12.5 12.1 11.7 12.0 12.4 13.4
13.8 10.2 9.2 8.5 10.6 11.9 23.0 11.4

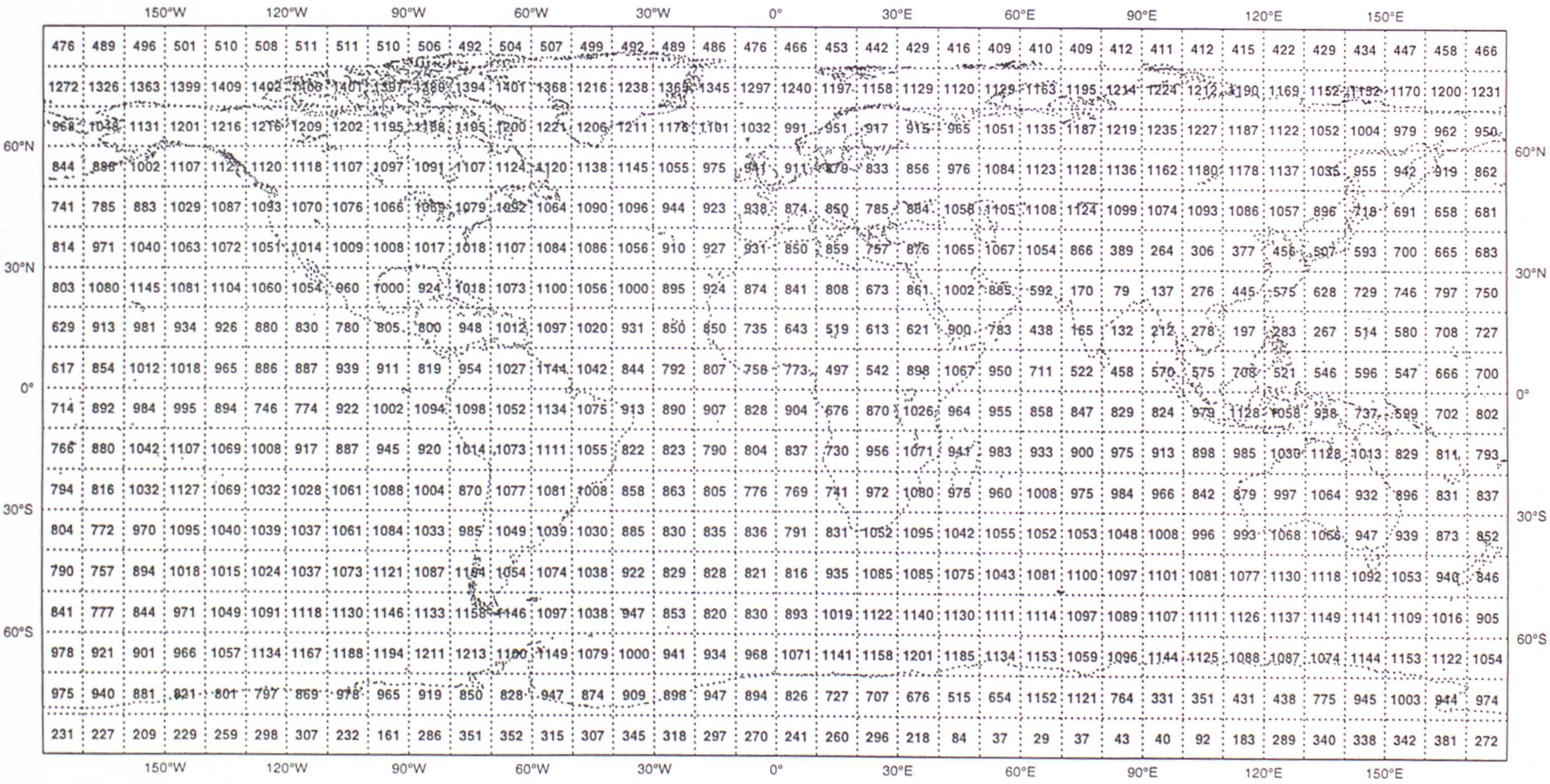
MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: Aug 03

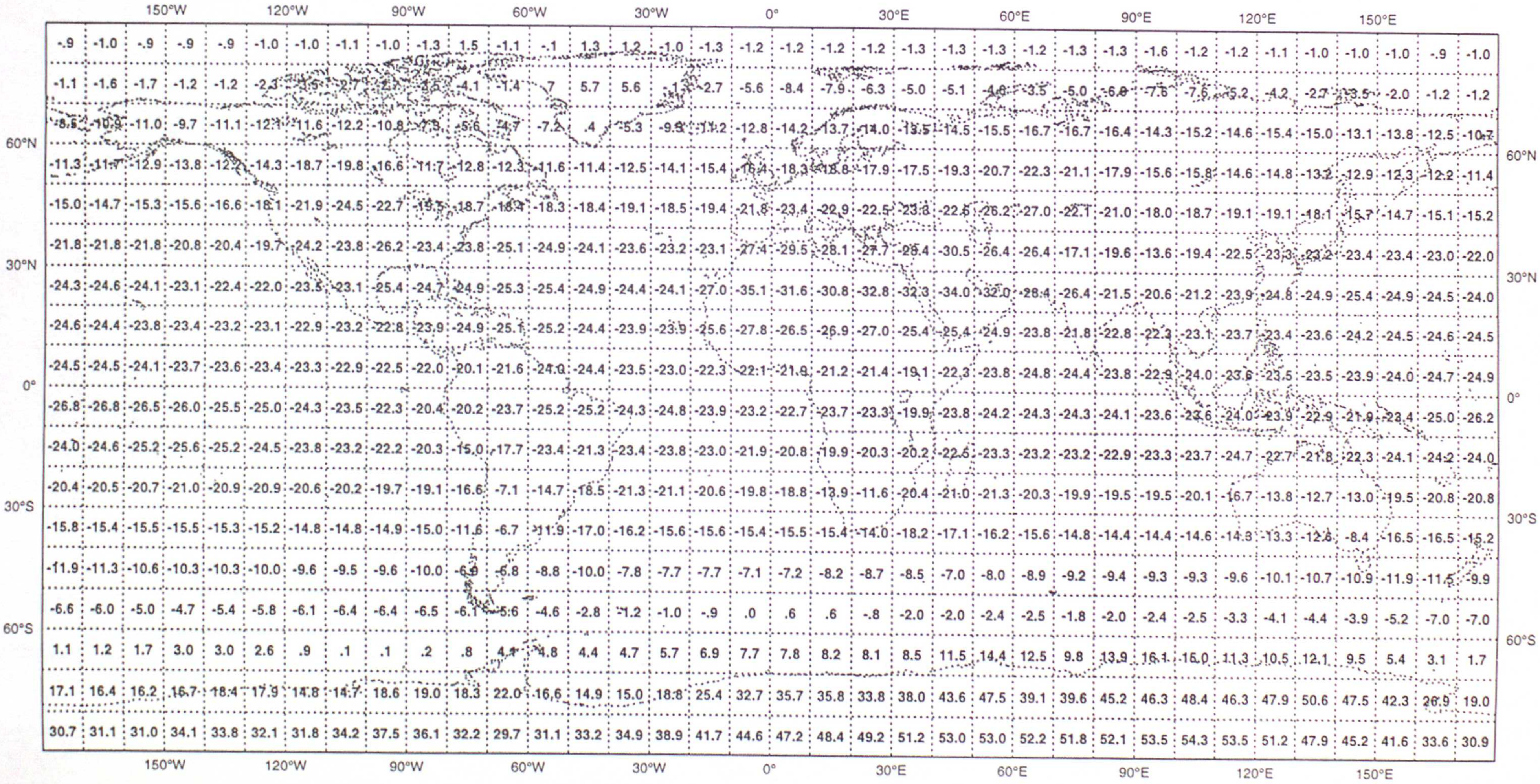
Monitoring procedures	
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100)
	:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. AUGUST 2003
NOAA15, using all observations
Global average number of observations in 24 hours = 573580



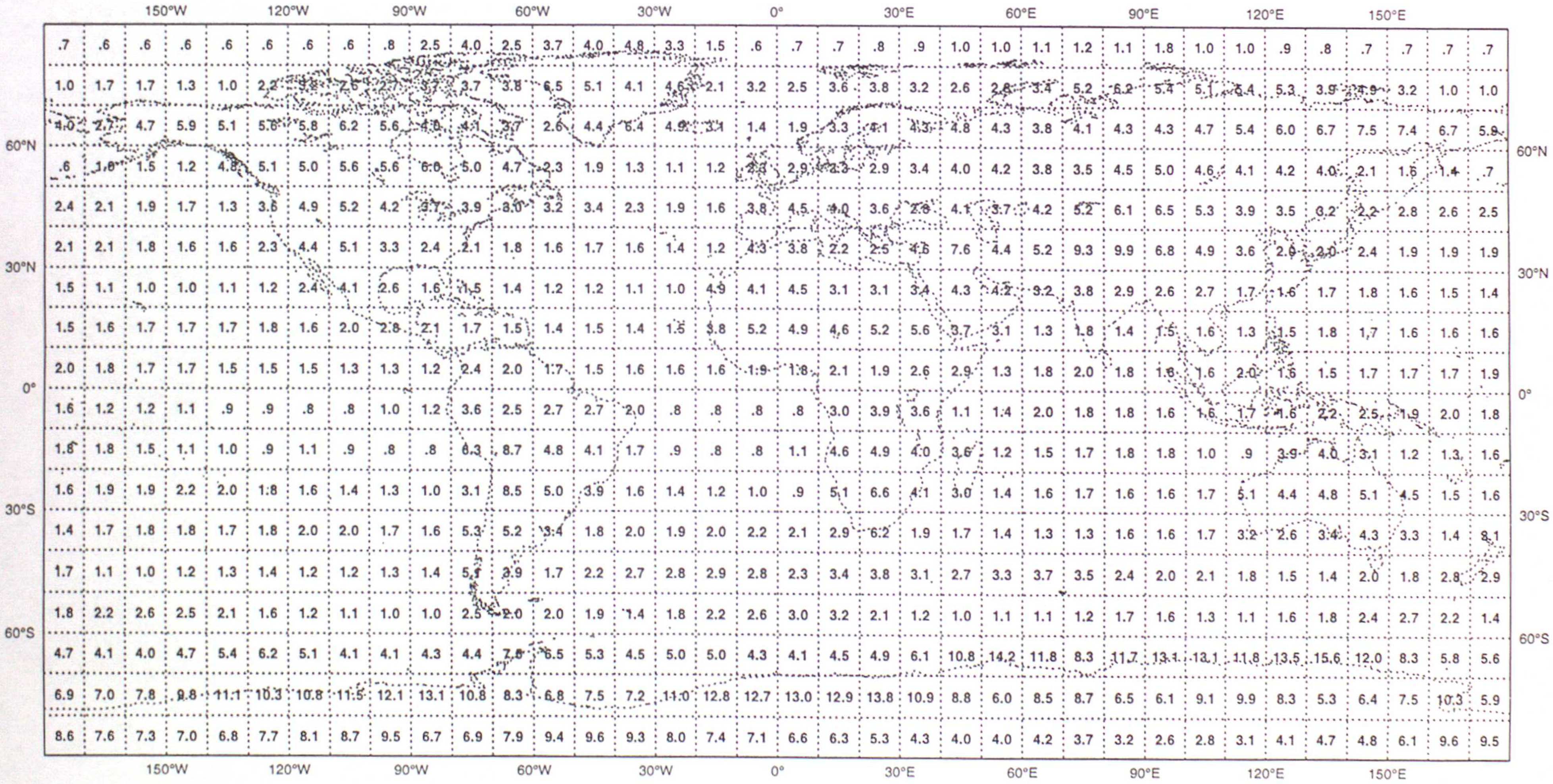
476	489	496	501	510	508	511	511	510	506	492	504	507	499	492	489	486	476	466	453	442	429	416	409	410	409	412	411	412	415	422	429	434	447	458	466
1272	1326	1363	1399	1409	1402	1406	1401	1397	1388	1394	1401	1368	1216	1238	1365	1345	1297	1240	1197	1158	1129	1120	1129	1163	1195	1214	1224	1212	1190	1169	1152	1152	1170	1200	1231
968	1048	1131	1201	1216	1216	1209	1202	1195	1188	1195	1200	1221	1206	1211	1176	1101	1032	991	951	917	915	965	1051	1135	1187	1219	1235	1227	1187	1122	1052	1004	979	962	950
844	886	1002	1107	1122	1120	1118	1107	1097	1091	1107	1124	1120	1138	1145	1055	975	941	911	879	833	856	976	1084	1123	1128	1136	1162	1180	1178	1137	1035	955	942	919	862
741	785	883	1029	1087	1093	1070	1076	1066	1069	1079	1092	1064	1090	1096	944	923	938	874	850	785	884	1058	1105	1108	1124	1099	1074	1093	1086	1057	896	718	691	658	681
814	971	1040	1063	1072	1051	1014	1009	1008	1017	1018	1107	1084	1086	1056	910	927	931	850	859	757	876	1065	1067	1054	866	389	264	306	377	456	507	593	700	665	683
803	1080	1145	1081	1104	1060	1054	960	1000	924	1018	1073	1100	1056	1000	895	924	874	841	808	673	861	1002	885	592	170	79	137	276	445	575	628	729	746	797	750
629	913	981	934	926	880	830	780	805	800	948	1012	1097	1020	931	850	850	735	643	519	613	621	900	783	438	165	132	212	278	197	283	267	514	580	708	727
617	854	1012	1018	965	886	887	939	911	819	954	1027	1144	1042	844	792	807	758	773	497	542	898	1067	950	711	522	458	570	575	708	521	546	596	547	666	700
714	892	984	995	894	746	774	922	1002	1094	1098	1052	1134	1075	913	890	907	828	904	676	870	1026	964	955	858	847	829	824	979	1128	1058	938	737	599	702	802
766	880	1042	1107	1069	1008	917	887	945	920	1014	1073	1111	1055	822	823	790	804	837	730	956	1071	941	983	933	900	975	913	898	985	1030	1128	1013	829	811	793
794	816	1032	1127	1069	1032	1028	1061	1088	1004	870	1077	1081	1008	858	863	805	776	769	741	972	1080	975	960	1008	975	984	966	842	879	997	1064	932	896	831	837
804	772	970	1095	1040	1039	1037	1061	1084	1033	985	1049	1039	1030	885	830	835	836	791	831	1052	1095	1042	1055	1052	1053	1048	1008	996	993	1068	1066	947	939	873	852
790	757	894	1018	1015	1024	1037	1073	1121	1087	1164	1054	1074	1038	922	829	828	821	816	935	1085	1085	1075	1043	1081	1100	1097	1101	1081	1077	1130	1118	1092	1053	940	846
841	777	844	971	1049	1091	1118	1130	1146	1133	1158	1146	1097	1038	947	853	820	830	893	1019	1122	1140	1130	1111	1114	1097	1089	1107	1111	1126	1137	1149	1141	1109	1016	905
978	921	901	966	1057	1134	1167	1188	1194	1211	1213	1100	1149	1079	1000	941	934	968	1071	1141	1158	1201	1185	1134	1153	1059	1096	1144	1125	1088	1087	1074	1144	1153	1122	1054
975	940	881	821	801	797	869	978	965	919	850	828	947	874	909	898	947	894	826	727	707	676	515	654	1152	1121	764	331	351	431	438	775	945	1003	944	974
231	227	209	229	259	298	307	232	161	286	351	352	315	307	345	318	297	270	241	260	296	218	84	37	29	37	43	40	92	183	289	340	338	342	381	272

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS8 (Surface)
NOAA15, using all observations



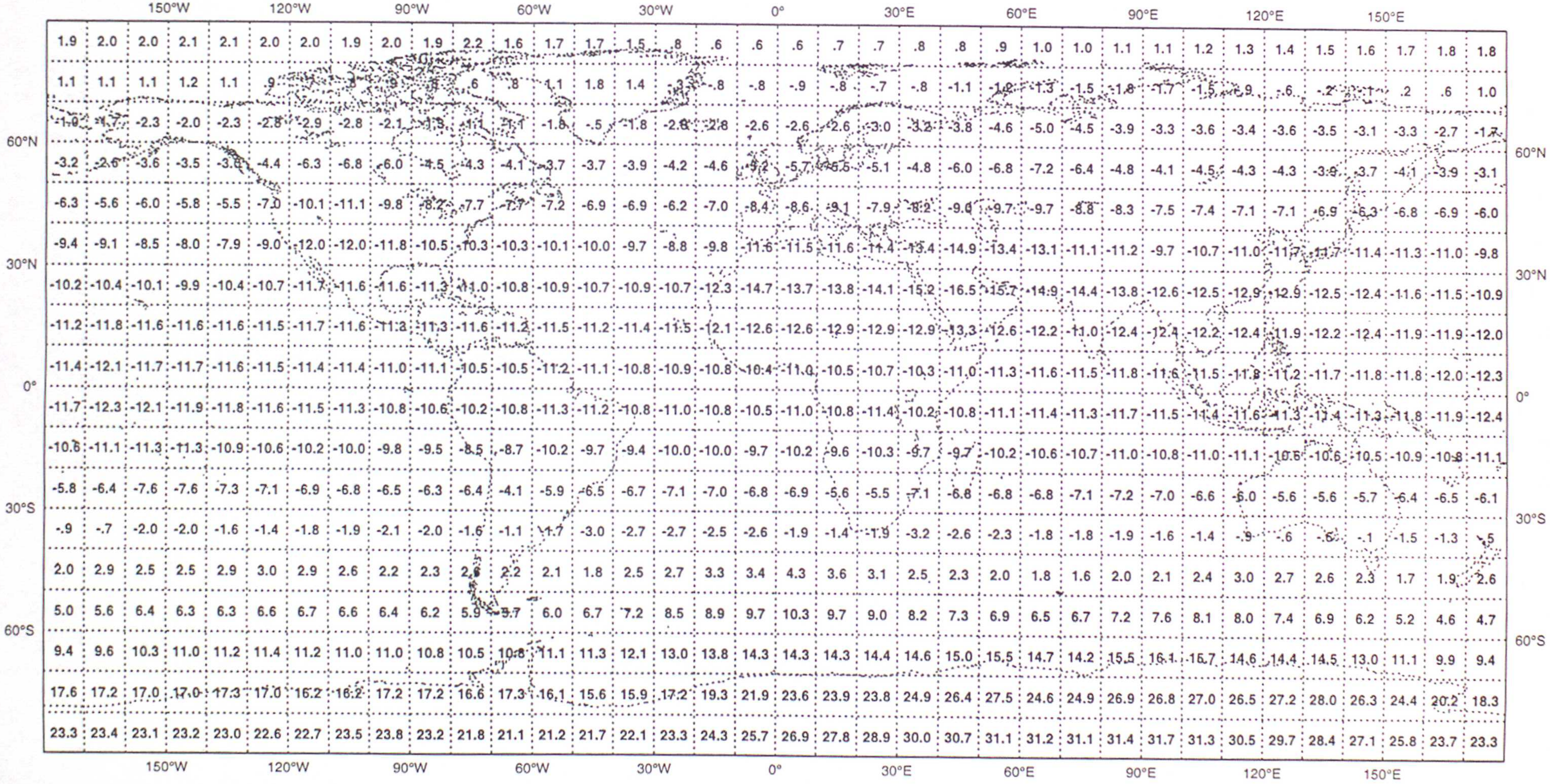
-.9	-1.0	-.9	-.9	-.9	-1.0	-1.0	-1.1	-1.0	-1.3	1.5	-1.1	-.1	1.3	1.2	-1.0	-1.3	-1.2	-1.2	-1.2	-1.2	-1.3	-1.3	-1.3	-1.2	-1.3	-1.3	-1.6	-1.2	-1.2	-1.1	-1.0	-1.0	-1.0	-.9	-1.0
-1.1	-1.6	-1.7	-1.2	-1.2	-2.3	-3.5	-2.7	-2.7	-3.5	-4.1	-1.4	.7	5.7	5.6	-1.3	-2.7	-5.6	-8.4	-7.9	-6.3	-5.0	-5.1	-4.6	-3.5	-5.0	-6.8	-7.6	-7.6	-5.2	-4.2	-2.7	-3.5	-2.0	-1.2	-1.2
-8.5	-10.9	-11.0	-9.7	-11.1	-12.1	-11.6	-12.2	-10.8	-7.3	-5.6	-4.7	-7.2	.4	-5.3	-9.8	-11.2	-12.8	-14.2	-13.7	-14.0	-13.5	-14.5	-15.5	-16.7	-16.7	-16.4	-14.3	-15.2	-14.6	-15.4	-15.0	-13.1	-13.8	-12.5	-10.7
-11.3	-11.7	-12.9	-13.8	-12.2	-14.3	-18.7	-19.8	-16.6	-11.7	-12.8	-12.3	-11.6	-11.4	-12.5	-14.1	-15.4	-16.4	-18.3	-18.8	-17.9	-17.5	-19.3	-20.7	-22.3	-21.1	-17.9	-15.6	-15.8	-14.6	-14.8	-13.2	-12.9	-12.3	-12.2	-11.4
-15.0	-14.7	-15.3	-15.6	-16.6	-18.1	-21.9	-24.5	-22.7	-19.5	-18.7	-18.4	-18.3	-18.4	-19.1	-18.5	-19.4	-21.8	-23.4	-22.9	-22.5	-23.8	-22.5	-26.2	-27.0	-22.1	-21.0	-18.0	-18.7	-19.1	-19.1	-18.1	-15.7	-14.7	-15.1	-15.2
-21.8	-21.8	-21.8	-20.8	-20.4	-19.7	-24.2	-23.8	-26.2	-23.4	-23.8	-25.1	-24.9	-24.1	-23.6	-23.2	-23.1	-27.4	-29.5	-28.1	-27.7	-28.4	-30.5	-26.4	-26.4	-17.1	-19.6	-13.6	-19.4	-22.5	-23.3	-23.2	-23.4	-23.4	-23.0	-22.0
-24.3	-24.6	-24.1	-23.1	-22.4	-22.0	-23.5	-23.1	-25.4	-24.7	-24.9	-25.3	-25.4	-24.9	-24.4	-24.1	-27.0	-35.1	-31.6	-30.8	-32.8	-32.3	-34.0	-32.0	-28.4	-26.4	-21.5	-20.6	-21.2	-23.9	-24.8	-24.9	-25.4	-24.9	-24.5	-24.0
-24.6	-24.4	-23.8	-23.4	-23.2	-23.1	-22.9	-23.2	-22.8	-23.9	-24.9	-25.1	-25.2	-24.4	-23.9	-23.9	-25.6	-27.8	-26.5	-26.9	-27.0	-25.4	-25.4	-24.9	-23.8	-21.8	-22.8	-22.3	-23.1	-23.7	-23.4	-23.6	-24.2	-24.5	-24.6	-24.5
-24.5	-24.5	-24.1	-23.7	-23.6	-23.4	-23.3	-22.9	-22.5	-22.0	-20.1	-21.6	-24.0	-24.4	-23.5	-23.0	-22.3	-22.1	-21.9	-21.2	-21.4	-19.1	-22.3	-23.8	-24.8	-24.4	-23.8	-22.9	-24.0	-23.6	-23.5	-23.5	-23.9	-24.0	-24.7	-24.9
-26.8	-26.8	-26.5	-26.0	-25.5	-25.0	-24.3	-23.5	-22.3	-20.4	-20.2	-23.7	-25.2	-25.2	-24.3	-24.8	-23.9	-23.2	-22.7	-23.7	-23.3	-19.9	-23.8	-24.2	-24.3	-24.3	-24.1	-23.6	-23.6	-24.0	-23.9	-22.9	-21.9	-23.4	-25.0	-26.2
-24.0	-24.6	-25.2	-25.6	-25.2	-24.5	-23.8	-23.2	-22.2	-20.3	-15.0	-17.7	-23.4	-21.3	-23.4	-23.8	-23.0	-21.9	-20.8	-19.9	-20.3	-20.2	-22.5	-23.3	-23.2	-23.2	-22.9	-23.3	-23.7	-24.7	-22.7	-21.8	-22.3	-24.1	-24.2	-24.0
-20.4	-20.5	-20.7	-21.0	-20.9	-20.9	-20.6	-20.2	-19.7	-19.1	-16.6	-7.1	-14.7	-18.5	-21.3	-21.1	-20.6	-19.8	-18.8	-13.9	-11.6	-20.4	-21.0	-21.3	-20.3	-19.9	-19.5	-19.5	-20.1	-16.7	-13.8	-12.7	-13.0	-19.5	-20.8	-20.8
-15.8	-15.4	-15.5	-15.5	-15.3	-15.2	-14.8	-14.8	-14.9	-15.0	-11.6	-6.7	-11.9	-17.0	-16.2	-15.6	-15.6	-15.4	-15.5	-15.4	-14.0	-18.2	-17.1	-16.2	-15.6	-14.8	-14.4	-14.4	-14.6	-14.3	-13.3	-12.6	-8.4	-16.5	-16.5	-15.2
-11.9	-11.3	-10.6	-10.3	-10.3	-10.0	-9.6	-9.5	-9.6	-10.0	-6.9	-6.8	-8.8	-10.0	-7.8	-7.7	-7.7	-7.1	-7.2	-8.2	-8.7	-8.5	-7.0	-8.0	-8.9	-9.2	-9.4	-9.3	-9.3	-9.6	-10.1	-10.7	-10.9	-11.9	-11.5	-9.9
-6.6	-6.0	-5.0	-4.7	-5.4	-5.8	-6.1	-6.4	-6.4	-6.5	-6.1	-5.6	-4.6	-2.8	-1.2	-1.0	-.9	.0	.6	.6	-.8	-2.0	-2.0	-2.4	-2.5	-1.8	-2.0	-2.4	-2.5	-3.3	-4.1	-4.4	-3.9	-5.2	-7.0	-7.0
1.1	1.2	1.7	3.0	3.0	2.6	.9	.1	.1	.2	.8	4.4	4.8	4.4	4.7	5.7	6.9	7.7	7.8	8.2	8.1	8.5	11.5	14.4	12.5	9.8	13.9	16.1	16.0	11.3	10.5	12.1	9.5	5.4	3.1	1.7
17.1	16.4	16.2	16.7	18.4	17.9	14.8	14.7	18.6	19.0	18.3	22.0	16.6	14.9	15.0	18.8	25.4	32.7	35.7	35.8	33.8	38.0	43.6	47.5	39.1	39.6	45.2	46.3	48.4	46.3	47.9	50.6	47.5	42.3	26.9	19.0
30.7	31.1	31.0	34.1	33.8	32.1	31.8	34.2	37.5	36.1	32.2	29.7	31.1	33.2	34.9	38.9	41.7	44.6	47.2	48.4	49.2	51.2	53.0	53.0	52.2	51.8	52.1	53.5	54.3	53.5	51.2	47.9	45.2	41.6	33.6	30.9

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS8 (Surface)
NOAA15, using all observations



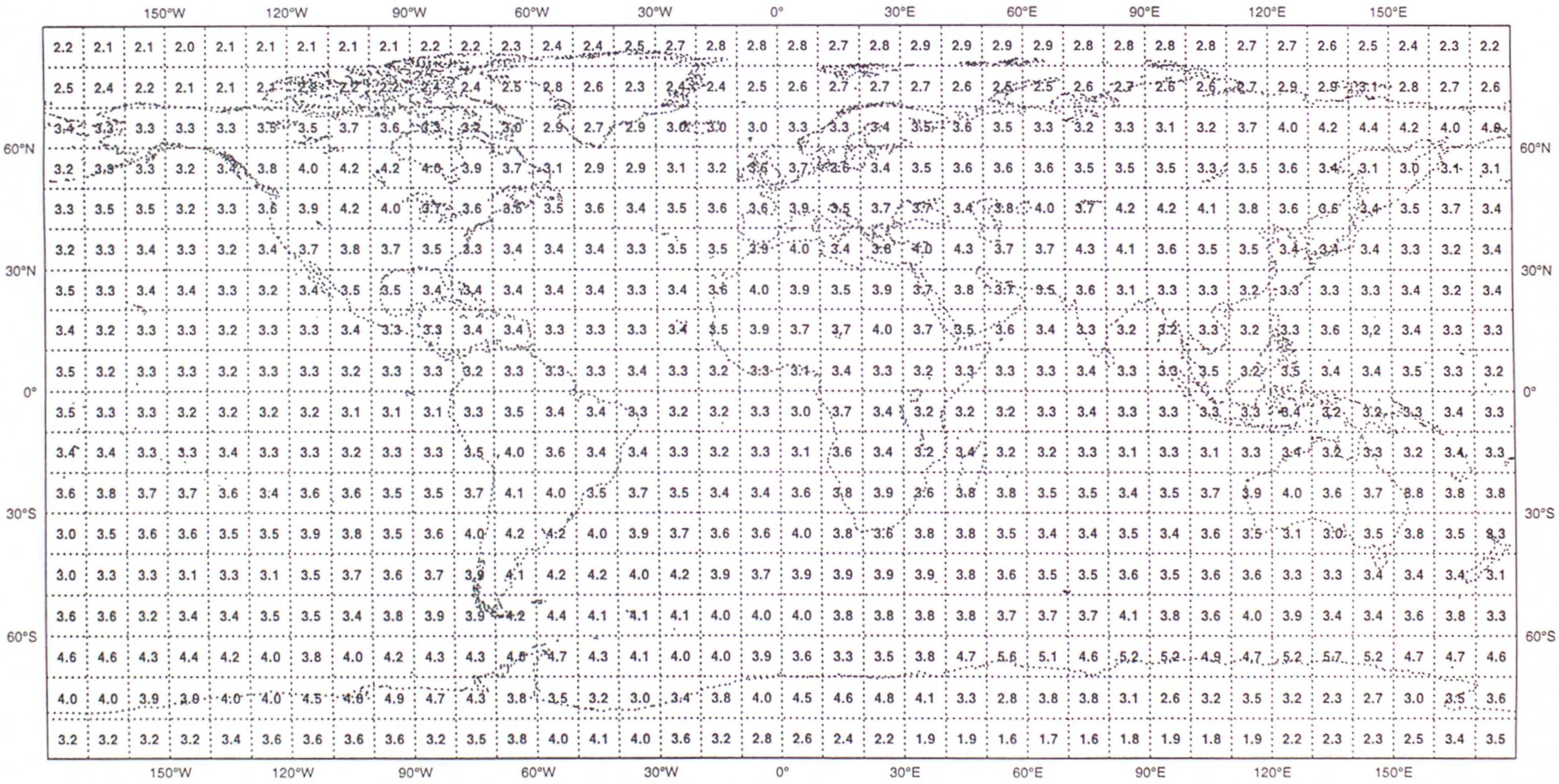
.7	.6	.6	.6	.6	.6	.6	.6	.8	2.5	4.0	2.5	3.7	4.0	4.8	3.3	1.5	.6	.7	.7	.8	.9	1.0	1.0	1.1	1.2	1.1	1.8	1.0	1.0	.9	.8	.7	.7	.7	.7
1.0	1.7	1.7	1.3	1.0	2.2	3.8	2.6	2.7	3.7	3.7	3.8	6.5	5.1	4.1	4.6	2.1	3.2	2.5	3.6	3.8	3.2	2.6	2.8	3.4	5.2	6.2	5.4	5.1	6.4	5.3	3.9	4.9	3.2	1.0	1.0
4.0	2.7	4.7	5.9	5.1	5.6	5.8	6.2	5.6	4.0	4.1	3.7	2.6	4.4	6.4	4.9	3.1	1.4	1.9	3.3	4.1	4.3	4.8	4.3	3.8	4.1	4.3	4.3	4.7	5.4	6.0	6.7	7.5	7.4	6.7	5.9
.6	1.6	1.5	1.2	4.8	5.1	5.0	5.6	5.6	6.0	5.0	4.7	2.3	1.9	1.3	1.1	1.2	2.3	2.9	2.3	2.9	3.4	4.0	4.2	3.8	3.5	4.5	5.0	4.6	4.1	4.2	4.0	2.1	1.6	1.4	.7
2.4	2.1	1.9	1.7	1.3	3.6	4.9	5.2	4.2	3.7	3.9	3.0	3.2	3.4	2.3	1.9	1.6	3.8	4.5	4.0	3.6	2.8	4.1	3.7	4.2	5.2	6.1	6.5	5.3	3.9	3.5	3.2	2.2	2.8	2.6	2.5
2.1	2.1	1.8	1.6	1.6	2.3	4.4	5.1	3.3	2.4	2.1	1.8	1.6	1.7	1.6	1.4	1.2	4.3	3.8	2.2	2.5	4.6	7.6	4.4	5.2	9.3	9.9	6.8	4.9	3.6	2.0	2.0	2.4	1.9	1.9	1.9
1.5	1.1	1.0	1.0	1.1	1.2	2.4	4.1	2.6	1.6	1.5	1.4	1.2	1.2	1.1	1.0	4.9	4.1	4.5	3.1	3.1	3.4	4.3	4.2	3.2	3.8	2.9	2.6	2.7	1.7	1.6	1.7	1.8	1.6	1.5	1.4
1.5	1.6	1.7	1.7	1.7	1.8	1.6	2.0	2.8	2.1	1.7	1.5	1.4	1.5	1.4	1.5	3.8	5.2	4.9	4.6	5.2	5.6	3.7	3.1	1.3	1.8	1.4	1.5	1.6	1.3	1.5	1.8	1.7	1.6	1.6	1.6
2.0	1.8	1.7	1.7	1.5	1.5	1.5	1.3	1.3	1.2	2.4	2.0	1.7	1.5	1.6	1.6	1.6	1.9	1.8	2.1	1.9	2.6	2.9	1.3	1.8	2.0	1.8	1.6	1.6	2.0	1.6	1.5	1.7	1.7	1.7	1.9
1.6	1.2	1.2	1.1	.9	.9	.8	.8	1.0	1.2	3.6	2.5	2.7	2.7	2.0	.8	.8	.8	.8	3.0	3.9	3.6	1.1	1.4	2.0	1.8	1.8	1.6	1.6	1.7	1.6	2.2	2.5	1.9	2.0	1.8
1.8	1.8	1.5	1.1	1.0	.9	1.1	.9	.8	.8	6.3	8.7	4.8	4.1	1.7	.9	.8	.8	1.1	4.6	4.9	4.0	3.6	1.2	1.5	1.7	1.8	1.8	1.0	.9	3.9	4.0	3.1	1.2	1.3	1.6
1.6	1.9	1.9	2.2	2.0	1.8	1.6	1.4	1.3	1.0	3.1	8.5	5.0	3.9	1.6	1.4	1.2	1.0	.9	5.1	6.6	4.1	3.0	1.4	1.6	1.7	1.6	1.6	1.7	5.1	4.4	4.8	5.1	4.5	1.5	1.6
1.4	1.7	1.8	1.8	1.7	1.8	2.0	2.0	1.7	1.6	5.3	5.2	3.4	1.8	2.0	1.9	2.0	2.2	2.1	2.9	6.2	1.9	1.7	1.4	1.3	1.3	1.6	1.6	1.7	3.2	2.6	3.4	4.3	3.3	1.4	8.1
1.7	1.1	1.0	1.2	1.3	1.4	1.2	1.2	1.3	1.4	5.1	3.9	1.7	2.2	2.7	2.8	2.9	2.8	2.3	3.4	3.8	3.1	2.7	3.3	3.7	3.5	2.4	2.0	2.1	1.8	1.5	1.4	2.0	1.8	2.8	2.9
1.8	2.2	2.6	2.5	2.1	1.6	1.2	1.1	1.0	1.0	2.5	2.0	2.0	1.9	1.4	1.8	2.2	2.6	3.0	3.2	2.1	1.2	1.0	1.1	1.1	1.2	1.7	1.6	1.3	1.1	1.6	1.8	2.4	2.7	2.2	1.4
4.7	4.1	4.0	4.7	5.4	6.2	5.1	4.1	4.1	4.3	4.4	7.6	6.5	5.3	4.5	5.0	5.0	4.3	4.1	4.5	4.9	6.1	10.8	14.2	11.8	8.3	11.7	13.1	13.1	11.8	13.5	15.6	12.0	8.3	5.8	5.6
6.9	7.0	7.8	9.8	11.1	10.3	10.8	11.5	12.1	13.1	10.8	8.3	6.8	7.5	7.2	11.0	12.8	12.7	13.0	12.9	13.8	10.9	8.8	6.0	8.5	8.7	6.5	6.1	9.1	9.9	8.3	5.3	6.4	7.5	10.3	5.9
8.6	7.6	7.3	7.0	6.8	7.7	8.1	8.7	9.5	6.7	6.9	7.9	9.4	9.6	9.3	8.0	7.4	7.1	6.6	6.3	5.3	4.3	4.0	4.0	4.2	3.7	3.2	2.6	2.8	3.1	4.1	4.7	4.8	6.1	9.6	9.5

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



1.9	2.0	2.0	2.1	2.1	2.0	2.0	1.9	2.0	1.9	2.2	1.6	1.7	1.7	1.5	.8	.6	.6	.6	.7	.7	.8	.8	.9	1.0	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8
1.1	1.1	1.1	1.2	1.1	.9	.7	.8	.9	.8	.6	.8	1.1	1.8	1.4	-.3	-.8	-.8	-.9	-.8	-.7	-.8	-1.1	-1.2	-1.3	-1.5	-1.8	-1.7	-1.5	-.9	-.6	-.2	-.1	.2	.6	1.0
-1.0	-1.7	-2.3	-2.0	-2.3	-2.8	-2.9	-2.8	-2.1	-1.3	-1.1	-1.1	-1.8	-.5	-1.8	-2.8	-2.8	-2.6	-2.6	-2.6	-3.0	-3.2	-3.8	-4.6	-5.0	-4.5	-3.9	-3.3	-3.6	-3.4	-3.6	-3.5	-3.1	-3.3	-2.7	-1.7
-3.2	-2.6	-3.6	-3.5	-3.6	-4.4	-6.3	-6.8	-6.0	-4.5	-4.3	-4.1	-3.7	-3.7	-3.9	-4.2	-4.6	-5.2	-5.7	-5.5	-5.1	-4.8	-6.0	-6.8	-7.2	-6.4	-4.8	-4.1	-4.5	-4.3	-4.3	-3.9	-3.7	-4.1	-3.9	-3.1
-6.3	-5.6	-6.0	-5.8	-5.5	-7.0	-10.1	-11.1	-9.8	-8.2	-7.7	-7.7	-7.2	-6.9	-6.9	-6.2	-7.0	-8.4	-8.6	-9.1	-7.9	-8.2	-9.0	-9.7	-9.7	-8.8	-8.3	-7.5	-7.4	-7.1	-7.1	-6.9	-6.3	-6.8	-6.9	-6.0
-9.4	-9.1	-8.5	-8.0	-7.9	-9.0	-12.0	-12.0	-11.8	-10.5	-10.3	-10.3	-10.1	-10.0	-9.7	-8.8	-9.8	-11.6	-11.5	-11.6	-11.4	-13.4	-14.9	-13.4	-13.1	-11.1	-11.2	-9.7	-10.7	-11.0	-11.7	-11.7	-11.4	-11.3	-11.0	-9.8
-10.2	-10.4	-10.1	-9.9	-10.4	-10.7	-11.7	-11.6	-11.6	-11.3	-11.0	-10.8	-10.9	-10.7	-10.9	-10.7	-12.3	-14.7	-13.7	-13.8	-14.1	-15.2	-16.5	-15.7	-14.9	-14.4	-13.8	-12.6	-12.5	-12.9	-12.9	-12.5	-12.4	-11.6	-11.5	-10.9
-11.2	-11.8	-11.6	-11.6	-11.6	-11.5	-11.7	-11.6	-11.3	-11.3	-11.6	-11.2	-11.5	-11.2	-11.4	-11.5	-12.1	-12.6	-12.6	-12.9	-12.9	-12.9	-13.3	-12.6	-12.2	-11.0	-12.4	-12.4	-12.2	-12.4	-11.9	-12.2	-12.4	-11.9	-11.9	-12.0
-11.4	-12.1	-11.7	-11.7	-11.6	-11.5	-11.4	-11.4	-11.0	-11.1	-10.5	-10.5	-11.2	-11.1	-10.8	-10.9	-10.8	-10.4	-11.0	-10.5	-10.7	-10.3	-11.0	-11.3	-11.6	-11.5	-11.8	-11.6	-11.5	-11.8	-11.2	-11.7	-11.8	-11.8	-12.0	-12.3
-11.7	-12.3	-12.1	-11.9	-11.8	-11.6	-11.5	-11.3	-10.8	-10.6	-10.2	-10.8	-11.3	-11.2	-10.8	-11.0	-10.8	-10.5	-11.0	-10.8	-11.4	-10.2	-10.8	-11.1	-11.4	-11.3	-11.7	-11.5	-11.4	-11.6	-11.3	-11.4	-11.3	-11.8	-11.9	-12.4
-10.6	-11.1	-11.3	-11.3	-10.9	-10.6	-10.2	-10.0	-9.8	-9.5	-8.5	-8.7	-10.2	-9.7	-9.4	-10.0	-10.0	-9.7	-10.2	-9.6	-10.3	-9.7	-9.7	-10.2	-10.6	-10.7	-11.0	-10.8	-11.0	-11.1	-10.6	-10.6	-10.5	-10.9	-10.8	-11.1
-5.8	-6.4	-7.6	-7.6	-7.3	-7.1	-6.9	-6.8	-6.5	-6.3	-6.4	-4.1	-5.9	-6.5	-6.7	-7.1	-7.0	-6.8	-6.9	-5.6	-5.5	-7.1	-6.8	-6.8	-6.8	-7.1	-7.2	-7.0	-6.6	-6.0	-5.6	-5.6	-5.7	-6.4	-6.5	-6.1
-.9	-.7	-2.0	-2.0	-1.6	-1.4	-1.8	-1.9	-2.1	-2.0	-1.6	-1.1	-1.7	-3.0	-2.7	-2.7	-2.5	-2.6	-1.9	-1.4	-1.9	-3.2	-2.6	-2.3	-1.8	-1.8	-1.9	-1.6	-1.4	-.9	-.6	-.6	-.1	-1.5	-1.3	.5
2.0	2.9	2.5	2.5	2.9	3.0	2.9	2.6	2.2	2.3	2.6	2.2	2.1	1.8	2.5	2.7	3.3	3.4	4.3	3.6	3.1	2.5	2.3	2.0	1.8	1.6	2.0	2.1	2.4	3.0	2.7	2.6	2.3	1.7	1.9	2.6
5.0	5.6	6.4	6.3	6.3	6.6	6.7	6.6	6.4	6.2	5.9	5.7	6.0	6.7	7.2	8.5	8.9	9.7	10.3	9.7	9.0	8.2	7.3	6.9	6.5	6.7	7.2	7.6	8.1	8.0	7.4	6.9	6.2	5.2	4.6	4.7
9.4	9.6	10.3	11.0	11.2	11.4	11.2	11.0	11.0	10.8	10.5	10.8	11.1	11.3	12.1	13.0	13.8	14.3	14.3	14.3	14.4	14.6	15.0	15.5	14.7	14.2	15.5	16.1	15.7	14.6	14.4	14.5	13.0	11.1	9.9	9.4
17.6	17.2	17.0	17.0	17.3	17.0	16.2	16.2	17.2	17.2	16.6	17.3	16.1	15.6	15.9	17.2	19.3	21.9	23.6	23.9	23.8	24.9	26.4	27.5	24.6	24.9	26.9	26.8	27.0	26.5	27.2	28.0	26.3	24.4	20.2	18.3
23.3	23.4	23.1	23.2	23.0	22.6	22.7	23.5	23.8	23.2	21.8	21.1	21.2	21.7	22.1	23.3	24.3	25.7	26.9	27.8	28.9	30.0	30.7	31.1	31.2	31.1	31.4	31.7	31.3	30.5	29.7	28.4	27.1	25.8	23.7	23.3

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.7	2.8	2.8	2.8	2.7	2.8	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.6	2.5	2.4	2.3	2.2
2.5	2.4	2.2	2.1	2.1	2.1	2.8	2.2	2.2	2.4	2.4	2.5	2.8	2.6	2.3	2.4	2.4	2.5	2.6	2.7	2.7	2.7	2.6	2.5	2.5	2.6	2.7	2.6	2.6	2.7	2.9	2.9	3.1	2.8	2.7	2.6
3.4	3.3	3.3	3.3	3.3	3.5	3.5	3.7	3.6	3.3	3.2	3.0	2.9	2.7	2.9	3.0	3.0	3.0	3.3	3.3	3.4	3.5	3.6	3.5	3.3	3.2	3.3	3.1	3.2	3.7	4.0	4.2	4.4	4.2	4.0	4.8
3.2	3.9	3.3	3.2	3.4	3.8	4.0	4.2	4.2	4.0	3.9	3.7	3.1	2.9	2.9	3.1	3.2	3.6	3.7	2.6	3.4	3.5	3.6	3.6	3.6	3.5	3.5	3.5	3.3	3.5	3.6	3.4	3.1	3.0	3.1	3.1
3.3	3.5	3.5	3.2	3.3	3.6	3.9	4.2	4.0	3.7	3.6	3.5	3.5	3.6	3.4	3.5	3.6	3.6	3.9	3.5	3.7	3.7	3.4	3.8	4.0	3.7	4.2	4.2	4.1	3.8	3.6	3.6	3.4	3.5	3.7	3.4
3.2	3.3	3.4	3.3	3.2	3.4	3.7	3.8	3.7	3.5	3.3	3.4	3.4	3.4	3.3	3.5	3.5	3.9	4.0	3.4	3.6	4.0	4.3	3.7	3.7	4.3	4.1	3.6	3.5	3.5	3.4	3.4	3.4	3.3	3.2	3.4
3.5	3.3	3.4	3.4	3.3	3.2	3.4	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.3	3.4	3.6	4.0	3.9	3.5	3.9	3.7	3.8	3.7	3.5	3.6	3.1	3.3	3.3	3.2	3.3	3.3	3.3	3.4	3.2	3.4
3.4	3.2	3.3	3.3	3.2	3.3	3.3	3.4	3.3	3.3	3.4	3.4	3.3	3.3	3.3	3.4	3.5	3.9	3.7	3.7	4.0	3.7	3.5	3.6	3.4	3.3	3.2	3.2	3.3	3.2	3.3	3.6	3.2	3.4	3.3	3.3
3.5	3.2	3.3	3.3	3.2	3.3	3.3	3.2	3.3	3.3	3.2	3.3	3.3	3.3	3.4	3.3	3.2	3.3	3.1	3.4	3.3	3.2	3.3	3.3	3.3	3.4	3.3	3.3	3.5	3.2	3.5	3.4	3.4	3.5	3.3	3.2
3.5	3.3	3.3	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.3	3.5	3.4	3.4	3.3	3.2	3.2	3.3	3.0	3.7	3.4	3.2	3.2	3.2	3.3	3.4	3.3	3.3	3.3	3.3	3.4	3.2	3.2	3.3	3.4	3.3
3.4	3.4	3.3	3.3	3.4	3.3	3.3	3.2	3.3	3.3	3.5	4.0	3.6	3.4	3.4	3.3	3.2	3.3	3.1	3.6	3.4	3.2	3.4	3.2	3.2	3.3	3.1	3.3	3.1	3.3	3.4	3.2	3.3	3.2	3.4	3.3
3.6	3.8	3.7	3.7	3.6	3.4	3.6	3.6	3.5	3.5	3.7	4.1	4.0	3.5	3.7	3.5	3.4	3.4	3.6	3.8	3.9	3.6	3.8	3.8	3.5	3.5	3.4	3.5	3.7	3.9	4.0	3.6	3.7	3.8	3.8	3.8
3.0	3.5	3.6	3.6	3.5	3.5	3.9	3.8	3.5	3.6	4.0	4.2	4.2	4.0	3.9	3.7	3.6	3.6	4.0	3.8	3.6	3.8	3.8	3.5	3.4	3.4	3.5	3.4	3.6	3.5	3.1	3.0	3.5	3.8	3.5	3.3
3.0	3.3	3.3	3.1	3.3	3.1	3.5	3.7	3.6	3.7	3.9	4.1	4.2	4.2	4.0	4.2	3.9	3.7	3.9	3.9	3.9	3.9	3.8	3.6	3.5	3.5	3.6	3.5	3.6	3.6	3.3	3.3	3.4	3.4	3.4	3.1
3.6	3.6	3.2	3.4	3.4	3.5	3.5	3.4	3.8	3.9	3.9	4.2	4.4	4.1	4.1	4.1	4.0	4.0	4.0	3.8	3.8	3.8	3.8	3.7	3.7	3.7	4.1	3.8	3.6	4.0	3.9	3.4	3.4	3.6	3.8	3.3
4.6	4.6	4.3	4.4	4.2	4.0	3.8	4.0	4.2	4.3	4.3	4.6	4.7	4.3	4.1	4.0	4.0	3.9	3.6	3.3	3.5	3.8	4.7	5.6	5.1	4.6	5.2	5.2	4.9	4.7	5.2	5.7	5.2	4.7	4.7	4.6
4.0	4.0	3.9	3.9	4.0	4.0	4.5	4.6	4.9	4.7	4.3	3.8	3.5	3.2	3.0	3.4	3.8	4.0	4.5	4.6	4.8	4.1	3.3	2.8	3.8	3.8	3.1	2.6	3.2	3.5	3.2	2.3	2.7	3.0	3.5	3.6
3.2	3.2	3.2	3.2	3.4	3.6	3.6	3.6	3.6	3.2	3.5	3.8	4.0	4.1	4.0	3.6	3.2	2.8	2.6	2.4	2.2	1.9	1.9	1.6	1.7	1.6	1.8	1.9	1.8	1.9	2.2	2.3	2.3	2.5	3.4	3.5

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

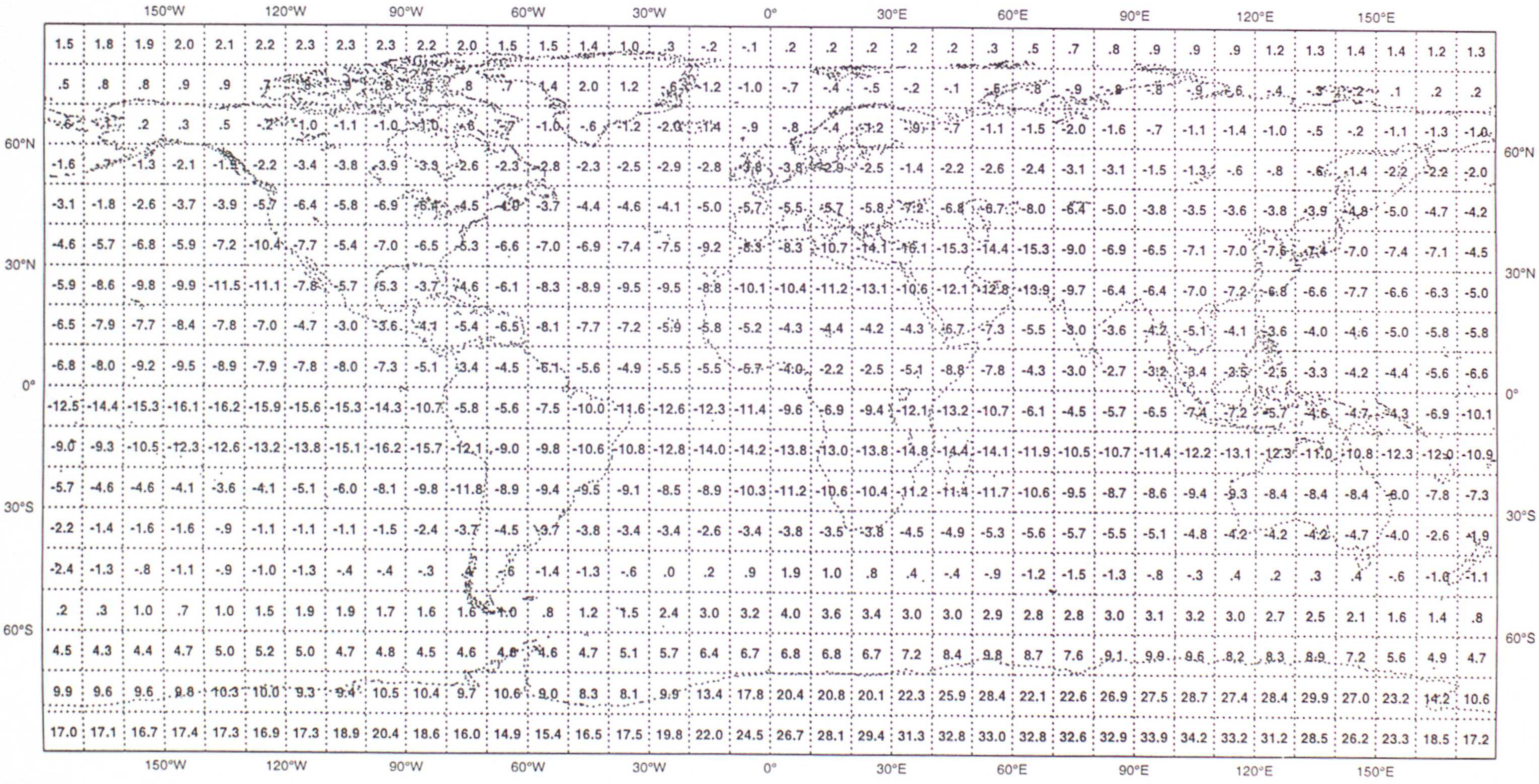
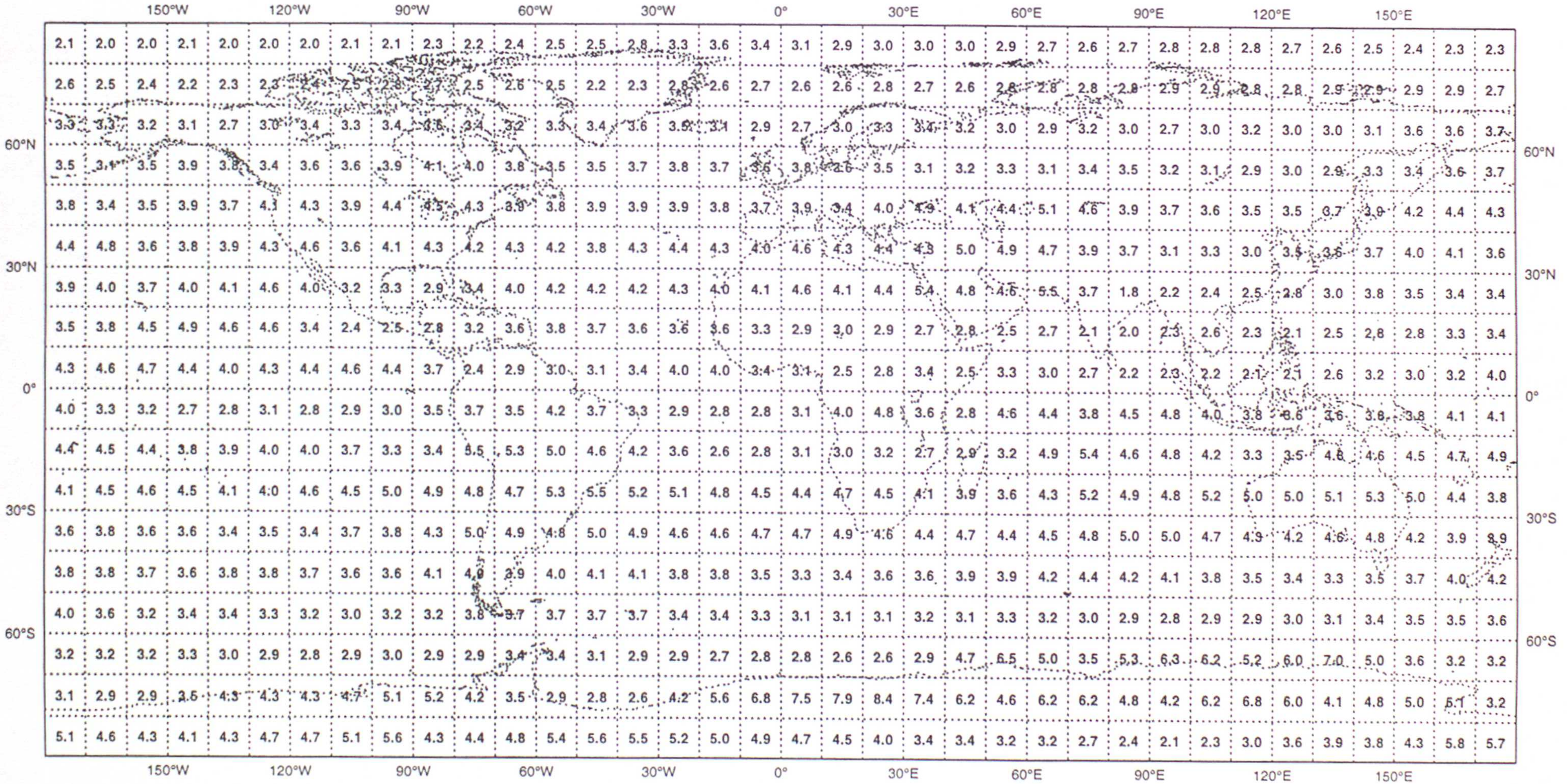
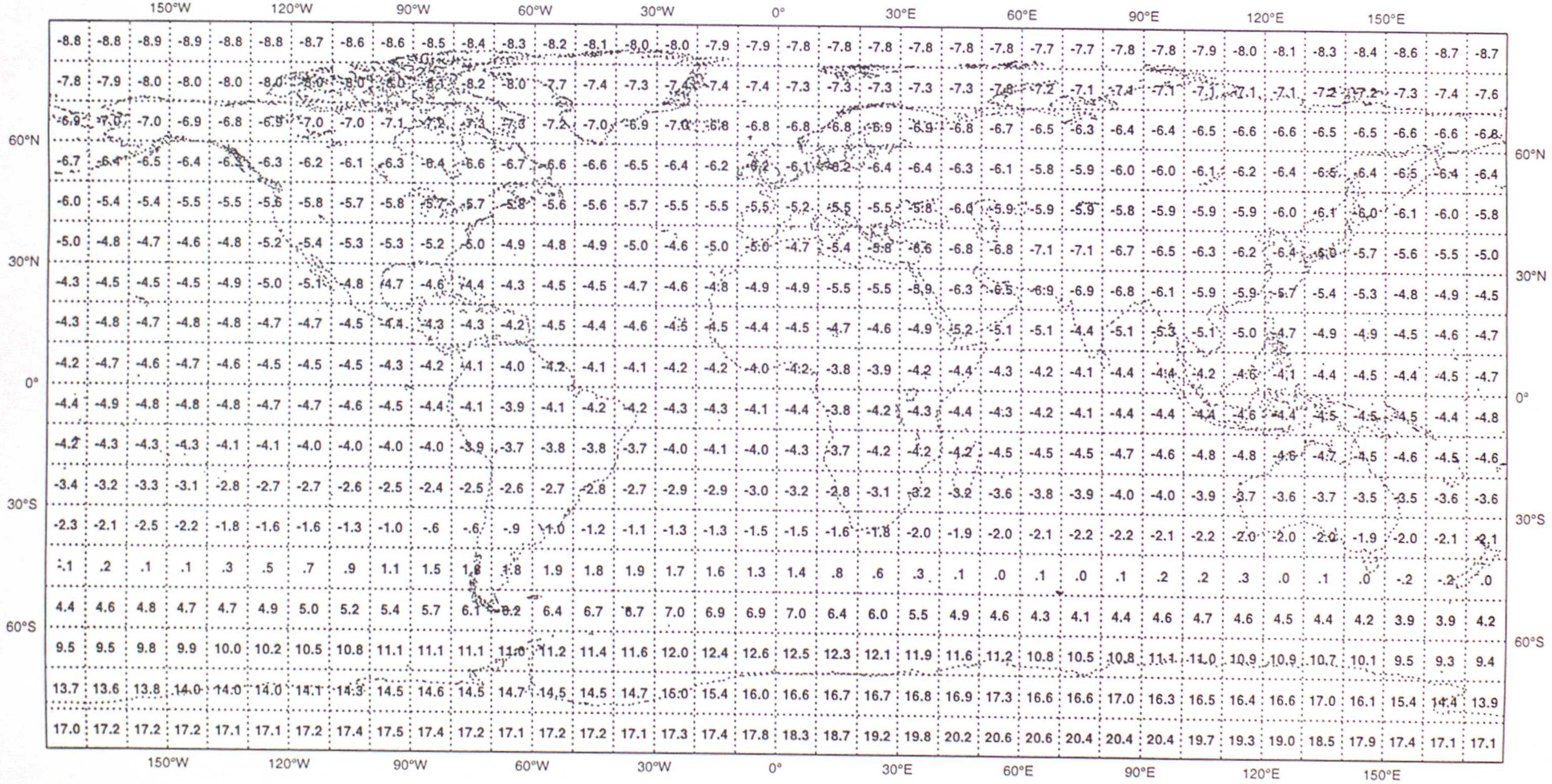

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1.5 1.8 1.9 2.0 2.1 2.2 2.3 2.3 2.3 2.2 2.0 1.5 1.5 1.4 1.0 .3 -.2 -.1 .2 .2 .2 .2 .2 .3 .5 .7 .8 .9 .9 .9 1.2 1.3 1.4 1.4 1.2 1.3
.5 .8 .8 .9 .9 .7 .8 .9 .8 .8 .8 .7 1.4 2.0 1.2 -.6 -1.2 -1.0 -.7 -.4 -.5 -.2 -.1 -.5 -.8 -.9 -.8 -.8 -.9 -.6 -.4 -.3 -.2 .1 .2 .2
-.6 -.7 .2 .3 .5 -.2 -1.0 -1.1 -1.0 -1.0 -.6 -.7 -1.0 -.6 -1.2 -2.0 -1.4 -.9 -.8 -.4 -1.2 -.9 -.7 -1.1 -1.5 -2.0 -1.6 -.7 -1.1 -1.4 -1.0 -.5 -.2 -1.1 -1.3 -1.0
-1.6 -.7 -1.3 -2.1 -1.8 -2.2 -3.4 -3.8 -3.9 -3.9 -2.6 -2.3 -2.8 -2.3 -2.5 -2.9 -2.8 -3.8 -3.8 -2.9 -2.5 -1.4 -2.2 -2.6 -2.4 -3.1 -3.1 -1.5 -1.3 -.6 -.8 -.6 -1.4 -2.2 -2.2 -2.0
-3.1 -1.8 -2.6 -3.7 -3.9 -5.7 -6.4 -5.8 -6.9 -6.4 -4.5 -4.0 -3.7 -4.4 -4.6 -4.1 -5.0 -5.7 -5.5 -5.7 -5.8 -7.2 -6.8 -6.7 -8.0 -6.4 -5.0 -3.8 -3.5 -3.6 -3.8 -3.9 -4.8 -5.0 -4.7 -4.2
-4.6 -5.7 -6.8 -5.9 -7.2 -10.4 -7.7 -5.4 -7.0 -6.5 -5.3 -6.6 -7.0 -6.9 -7.4 -7.5 -9.2 -8.3 -8.3 -10.7 -14.1 -16.1 -15.3 -14.4 -15.3 -9.0 -6.9 -6.5 -7.1 -7.0 -7.6 -7.4 -7.0 -7.4 -7.1 -4.5
-5.9 -8.6 -9.8 -9.9 -11.5 -11.1 -7.8 -5.7 -5.3 -3.7 -4.6 -6.1 -8.3 -8.9 -9.5 -9.5 -8.8 -10.1 -10.4 -11.2 -13.1 -10.6 -12.1 -12.8 -13.9 -9.7 -6.4 -6.4 -7.0 -7.2 -6.8 -6.6 -7.7 -6.6 -6.3 -5.0
-6.5 -7.9 -7.7 -8.4 -7.8 -7.0 -4.7 -3.0 -3.6 -4.1 -5.4 -6.5 -8.1 -7.7 -7.2 -5.9 -5.8 -5.2 -4.3 -4.4 -4.2 -4.3 -6.7 -7.3 -5.5 -3.0 -3.6 -4.2 -5.1 -4.1 -3.6 -4.0 -4.6 -5.0 -5.8 -5.8
-6.8 -8.0 -9.2 -9.5 -8.9 -7.9 -7.8 -8.0 -7.3 -5.1 -3.4 -4.5 -6.1 -5.6 -4.9 -5.5 -5.5 -5.7 -4.0 -2.2 -2.5 -5.1 -8.8 -7.8 -4.3 -3.0 -2.7 -3.2 -3.4 -3.5 -2.5 -3.3 -4.2 -4.4 -5.6 -6.6
-12.5 -14.4 -15.3 -16.1 -16.2 -15.9 -15.6 -15.3 -14.3 -10.7 -5.8 -5.6 -7.5 -10.0 -11.6 -12.6 -12.3 -11.4 -9.6 -6.9 -9.4 -12.1 -13.2 -10.7 -6.1 -4.5 -5.7 -6.5 -7.4 -7.2 -5.7 -4.6 -4.7 -4.3 -6.9 -10.1
-9.0 -9.3 -10.5 -12.3 -12.6 -13.2 -13.8 -15.1 -16.2 -15.7 -12.1 -9.0 -9.8 -10.6 -10.8 -12.8 -14.0 -14.2 -13.8 -13.0 -13.8 -14.8 -14.4 -14.1 -11.9 -10.5 -10.7 -11.4 -12.2 -13.1 -12.3 -11.0 -10.8 -12.3 -12.0 -10.9
-5.7 -4.6 -4.6 -4.1 -3.6 -4.1 -5.1 -6.0 -8.1 -9.8 -11.8 -8.9 -9.4 -9.5 -9.1 -8.5 -8.9 -10.3 -11.2 -10.6 -10.4 -11.2 -11.4 -11.7 -10.6 -9.5 -8.7 -8.6 -9.4 -9.3 -8.4 -8.4 -8.4 -8.0 -7.8 -7.3
-2.2 -1.4 -1.6 -1.6 -.9 -1.1 -1.1 -1.1 -1.5 -2.4 -3.7 -4.5 -3.7 -3.8 -3.4 -3.4 -2.6 -3.4 -3.8 -3.5 -3.8 -4.5 -4.9 -5.3 -5.6 -5.7 -5.5 -5.1 -4.8 -4.2 -4.2 -4.2 -4.7 -4.0 -2.6 -1.9
-2.4 -1.3 -.8 -1.1 -.9 -1.0 -1.3 -.4 -.4 -.3 .4 -.6 -1.4 -1.3 -.6 .0 .2 .9 1.9 1.0 .8 .4 -.4 -.9 -1.2 -1.5 -1.3 -.8 -.3 .4 .2 .3 .4 -.6 -1.0 -1.1
.2 .3 1.0 .7 1.0 1.5 1.9 1.9 1.7 1.6 1.6 1.0 .8 1.2 1.5 2.4 3.0 3.2 4.0 3.6 3.4 3.0 3.0 2.9 2.8 2.8 3.0 3.1 3.2 3.0 2.7 2.5 2.1 1.6 1.4 .8
4.5 4.3 4.4 4.7 5.0 5.2 5.0 4.7 4.8 4.5 4.6 4.8 4.6 4.7 5.1 5.7 6.4 6.7 6.8 6.8 6.7 7.2 8.4 9.8 8.7 7.6 9.1 9.9 9.6 8.2 8.3 8.9 7.2 5.6 4.9 4.7
9.9 9.6 9.6 9.8 10.3 10.0 9.3 9.4 10.5 10.4 9.7 10.6 9.0 8.3 8.1 9.9 13.4 17.8 20.4 20.8 20.1 22.3 25.9 28.4 22.1 22.6 26.9 27.5 28.7 27.4 28.4 29.9 27.0 23.2 14.2 10.6
17.0 17.1 16.7 17.4 17.3 16.9 17.3 18.9 20.4 18.6 16.0 14.9 15.4 16.5 17.5 19.8 22.0 24.5 26.7 28.1 29.4 31.3 32.8 33.0 32.8 32.6 32.9 33.9 34.2 33.2 31.2 28.5 26.2 23.3 18.5 17.2

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



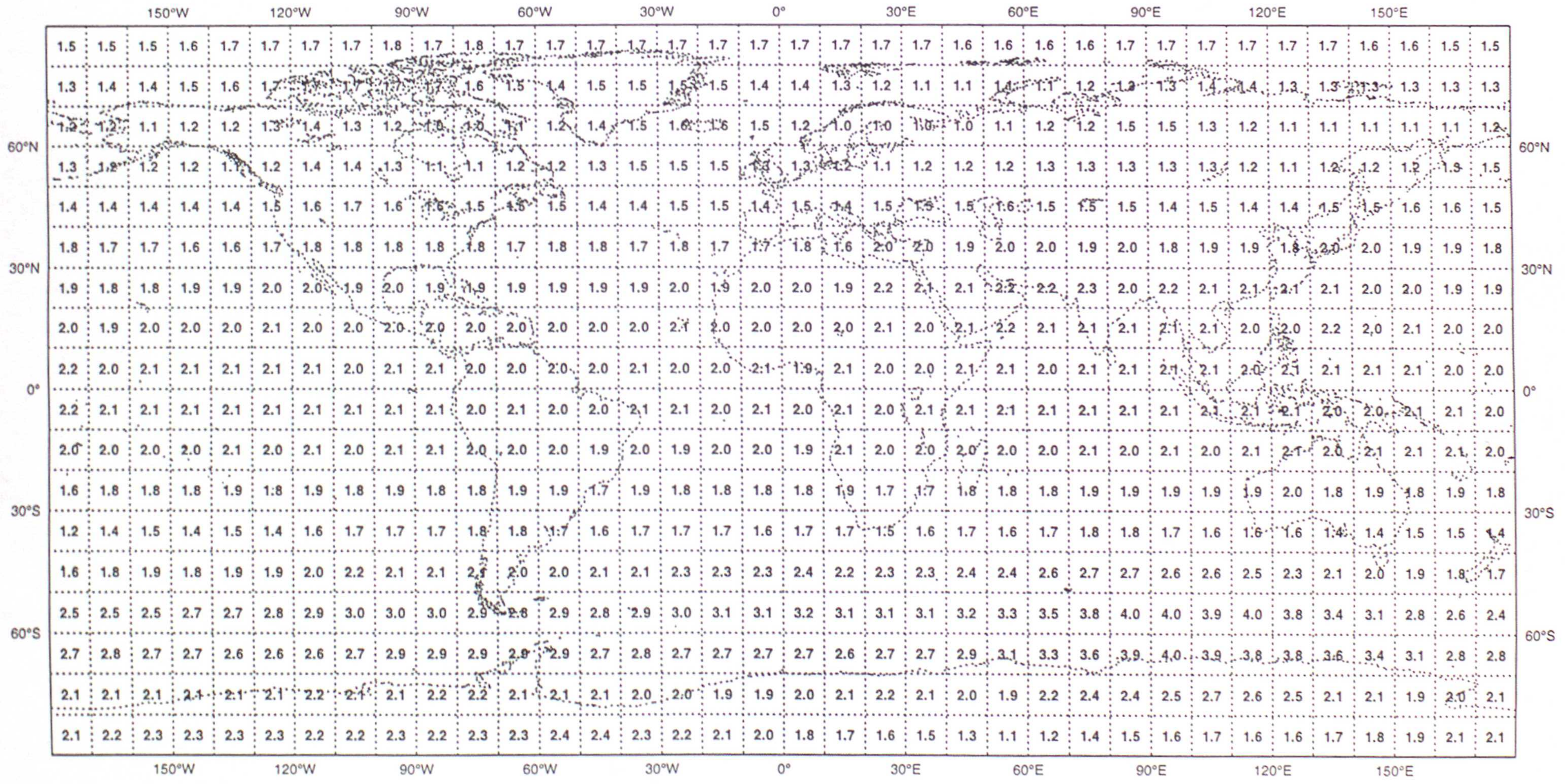
2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.3	2.2	2.4	2.5	2.5	2.8	3.3	3.6	3.4	3.1	2.9	3.0	3.0	3.0	2.9	2.7	2.6	2.7	2.8	2.8	2.8	2.7	2.6	2.5	2.4	2.3	2.3
2.6	2.5	2.4	2.2	2.3	2.3	2.4	2.5	2.8	2.7	2.5	2.6	2.5	2.2	2.3	2.8	2.6	2.7	2.6	2.6	2.8	2.7	2.6	2.8	2.8	2.8	2.8	2.9	2.9	2.8	2.8	2.9	2.9	2.9	2.9	2.7
3.3	3.3	3.2	3.1	2.7	3.0	3.4	3.3	3.4	3.6	3.4	3.2	3.3	3.4	3.6	3.5	3.1	2.9	2.7	3.0	3.3	3.4	3.2	3.0	2.9	3.2	3.0	2.7	3.0	3.2	3.0	3.0	3.1	3.6	3.6	3.7
3.5	3.1	3.5	3.9	3.8	3.4	3.6	3.6	3.9	4.1	4.0	3.8	3.5	3.5	3.7	3.8	3.7	3.6	3.8	2.6	3.5	3.1	3.2	3.3	3.1	3.4	3.5	3.2	3.1	2.9	3.0	2.9	3.3	3.4	3.6	3.7
3.8	3.4	3.5	3.9	3.7	4.1	4.3	3.9	4.4	4.5	4.3	3.9	3.8	3.9	3.9	3.9	3.8	3.7	3.9	3.4	4.0	4.9	4.1	4.4	5.1	4.6	3.9	3.7	3.6	3.5	3.5	3.7	3.9	4.2	4.4	4.3
4.4	4.8	3.6	3.8	3.9	4.3	4.6	3.6	4.1	4.3	4.2	4.3	4.2	3.8	4.3	4.4	4.3	4.0	4.6	4.3	4.4	4.3	5.0	4.9	4.7	3.9	3.7	3.1	3.3	3.0	3.5	3.6	3.7	4.0	4.1	3.6
3.9	4.0	3.7	4.0	4.1	4.6	4.0	3.2	3.3	2.9	3.4	4.0	4.2	4.2	4.2	4.3	4.0	4.1	4.6	4.1	4.4	5.4	4.8	4.6	5.5	3.7	1.8	2.2	2.4	2.5	2.8	3.0	3.8	3.5	3.4	3.4
3.5	3.8	4.5	4.9	4.6	4.6	3.4	2.4	2.5	2.8	3.2	3.6	3.8	3.7	3.6	3.6	3.6	3.3	2.9	3.0	2.9	2.7	2.8	2.5	2.7	2.1	2.0	2.3	2.6	2.3	2.1	2.5	2.8	2.8	3.3	3.4
4.3	4.6	4.7	4.4	4.0	4.3	4.4	4.6	4.4	3.7	2.4	2.9	3.0	3.1	3.4	4.0	4.0	3.4	3.1	2.5	2.8	3.4	2.5	3.3	3.0	2.7	2.2	2.3	2.2	2.1	2.1	2.6	3.2	3.0	3.2	4.0
4.0	3.3	3.2	2.7	2.8	3.1	2.8	2.9	3.0	3.5	3.7	3.5	4.2	3.7	3.3	2.9	2.8	2.8	3.1	4.0	4.8	3.6	2.8	4.6	4.4	3.8	4.5	4.8	4.0	3.8	3.6	3.6	3.8	3.8	4.1	4.1
4.4	4.5	4.4	3.8	3.9	4.0	4.0	3.7	3.3	3.4	5.5	5.3	5.0	4.6	4.2	3.6	2.6	2.8	3.1	3.0	3.2	2.7	2.9	3.2	4.9	5.4	4.6	4.8	4.2	3.3	3.5	4.8	4.6	4.5	4.7	4.9
4.1	4.5	4.6	4.5	4.1	4.0	4.6	4.5	5.0	4.9	4.8	4.7	5.3	5.5	5.2	5.1	4.8	4.5	4.4	4.7	4.5	4.1	3.9	3.6	4.3	5.2	4.9	4.8	5.2	5.0	5.0	5.1	5.3	5.0	4.4	3.8
3.6	3.8	3.6	3.6	3.4	3.5	3.4	3.7	3.8	4.3	5.0	4.9	4.8	5.0	4.9	4.6	4.6	4.7	4.7	4.9	4.6	4.4	4.7	4.4	4.5	4.8	5.0	5.0	4.7	4.9	4.2	4.6	4.8	4.2	3.9	3.9
3.8	3.8	3.7	3.6	3.8	3.8	3.7	3.6	3.6	4.1	4.9	3.9	4.0	4.1	4.1	3.8	3.8	3.5	3.3	3.4	3.6	3.6	3.9	3.9	4.2	4.4	4.2	4.1	3.8	3.5	3.4	3.3	3.5	3.7	4.0	4.2
4.0	3.6	3.2	3.4	3.4	3.3	3.2	3.0	3.2	3.2	3.8	3.7	3.7	3.7	3.7	3.4	3.4	3.3	3.1	3.1	3.1	3.2	3.1	3.3	3.2	3.0	2.9	2.8	2.9	2.9	3.0	3.1	3.4	3.5	3.5	3.6
3.2	3.2	3.2	3.3	3.0	2.9	2.8	2.9	3.0	2.9	2.9	3.4	3.4	3.1	2.9	2.9	2.7	2.8	2.8	2.6	2.6	2.9	4.7	6.5	5.0	3.5	5.3	6.3	6.2	5.2	6.0	7.0	5.0	3.6	3.2	3.2
3.1	2.9	2.9	3.5	4.3	4.3	4.3	4.7	5.1	5.2	4.2	3.5	2.9	2.8	2.6	4.2	5.6	6.8	7.5	7.9	8.4	7.4	6.2	4.6	6.2	6.2	4.8	4.2	6.2	6.8	6.0	4.1	4.8	5.0	5.1	3.2
5.1	4.6	4.3	4.1	4.3	4.7	4.7	5.1	5.6	4.3	4.4	4.8	5.4	5.6	5.5	5.2	5.0	4.9	4.7	4.5	4.0	3.4	3.4	3.2	3.2	2.7	2.4	2.1	2.3	3.0	3.6	3.9	3.8	4.3	5.8	5.7

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



-8.8	-8.8	-8.9	-8.9	-8.8	-8.8	-8.7	-8.6	-8.6	-8.5	-8.4	-8.3	-8.2	-8.1	-8.0	-8.0	-7.9	-7.9	-7.8	-7.8	-7.8	-7.8	-7.8	-7.8	-7.7	-7.7	-7.8	-7.8	-7.9	-8.0	-8.1	-8.3	-8.4	-8.6	-8.7	-8.7
-7.8	-7.9	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.1	-8.2	-8.0	-7.7	-7.4	-7.3	-7.4	-7.4	-7.4	-7.3	-7.3	-7.3	-7.3	-7.3	-7.8	-7.2	-7.1	-7.4	-7.1	-7.1	-7.1	-7.1	-7.2	-7.2	-7.3	-7.4	-7.6
-6.9	-7.0	-7.0	-6.9	-6.8	-6.9	-7.0	-7.0	-7.1	-7.2	-7.3	-7.3	-7.2	-7.0	-6.9	-7.0	-6.8	-6.8	-6.8	-6.8	-6.9	-6.9	-6.8	-6.7	-6.5	-6.3	-6.4	-6.4	-6.5	-6.6	-6.6	-6.5	-6.5	-6.6	-6.6	-6.8
-6.7	-6.4	-6.5	-6.4	-6.3	-6.3	-6.2	-6.1	-6.3	-6.4	-6.6	-6.7	-6.6	-6.6	-6.5	-6.4	-6.2	-6.2	-6.1	-6.2	-6.4	-6.4	-6.3	-6.1	-5.8	-5.9	-6.0	-6.0	-6.1	-6.2	-6.4	-6.5	-6.4	-6.5	-6.4	-6.4
-6.0	-5.4	-5.4	-5.5	-5.5	-5.6	-5.8	-5.7	-5.8	-5.7	-5.7	-5.8	-5.6	-5.6	-5.7	-5.5	-5.5	-5.5	-5.2	-5.5	-5.5	-5.8	-6.0	-5.9	-5.9	-5.9	-5.8	-5.9	-5.9	-5.9	-6.0	-6.1	-6.0	-6.1	-6.0	-5.8
-5.0	-4.8	-4.7	-4.6	-4.8	-5.2	-5.4	-5.3	-5.3	-5.2	-5.0	-4.9	-4.8	-4.9	-5.0	-4.6	-5.0	-5.0	-4.7	-5.4	-5.8	-6.6	-6.8	-6.8	-7.1	-7.1	-6.7	-6.5	-6.3	-6.2	-6.4	-6.0	-5.7	-5.6	-5.5	-5.0
-4.3	-4.5	-4.5	-4.5	-4.9	-5.0	-5.1	-4.8	-4.7	-4.6	-4.4	-4.3	-4.5	-4.5	-4.7	-4.6	-4.8	-4.9	-4.9	-5.5	-5.5	-5.9	-6.3	-6.5	-6.9	-6.9	-6.8	-6.1	-5.9	-5.9	-5.7	-5.4	-5.3	-4.8	-4.9	-4.5
-4.3	-4.8	-4.7	-4.8	-4.8	-4.7	-4.7	-4.5	-4.4	-4.3	-4.3	-4.2	-4.5	-4.4	-4.6	-4.5	-4.5	-4.4	-4.5	-4.7	-4.6	-4.9	-5.2	-5.1	-5.1	-4.4	-5.1	-5.3	-5.1	-5.0	-4.7	-4.9	-4.9	-4.5	-4.6	-4.7
-4.2	-4.7	-4.6	-4.7	-4.6	-4.5	-4.5	-4.5	-4.3	-4.2	-4.1	-4.0	-4.2	-4.1	-4.1	-4.2	-4.2	-4.0	-4.2	-3.8	-3.9	-4.2	-4.4	-4.3	-4.2	-4.1	-4.4	-4.4	-4.2	-4.6	-4.1	-4.4	-4.5	-4.4	-4.5	-4.7
-4.4	-4.9	-4.8	-4.8	-4.8	-4.7	-4.7	-4.6	-4.5	-4.4	-4.1	-3.9	-4.1	-4.2	-4.2	-4.3	-4.3	-4.1	-4.4	-3.8	-4.2	-4.3	-4.4	-4.3	-4.2	-4.1	-4.4	-4.4	-4.4	-4.6	-4.4	-4.5	-4.5	-4.5	-4.4	-4.8
-4.2	-4.3	-4.3	-4.3	-4.1	-4.1	-4.0	-4.0	-4.0	-4.0	-3.9	-3.7	-3.8	-3.8	-3.7	-4.0	-4.1	-4.0	-4.3	-3.7	-4.2	-4.2	-4.2	-4.5	-4.5	-4.5	-4.7	-4.6	-4.8	-4.8	-4.6	-4.7	-4.5	-4.6	-4.5	-4.6
-3.4	-3.2	-3.3	-3.1	-2.8	-2.7	-2.7	-2.6	-2.5	-2.4	-2.5	-2.6	-2.7	-2.8	-2.7	-2.9	-2.9	-3.0	-3.2	-2.8	-3.1	-3.2	-3.2	-3.6	-3.8	-3.9	-4.0	-4.0	-3.9	-3.7	-3.6	-3.7	-3.5	-3.5	-3.6	-3.6
-2.3	-2.1	-2.5	-2.2	-1.8	-1.6	-1.6	-1.3	-1.0	-.6	-.6	-.9	-1.0	-1.2	-1.1	-1.3	-1.3	-1.5	-1.5	-1.6	-1.8	-2.0	-1.9	-2.0	-2.1	-2.2	-2.2	-2.1	-2.2	-2.0	-2.0	-2.0	-1.9	-2.0	-2.1	-2.1
-.1	.2	.1	.1	.3	.5	.7	.9	1.1	1.5	1.8	1.8	1.9	1.8	1.9	1.7	1.6	1.3	1.4	.8	.6	.3	.1	.0	.1	.0	.1	.2	.2	.3	.0	.1	.0	-.2	-.2	.0
4.4	4.6	4.8	4.7	4.7	4.9	5.0	5.2	5.4	5.7	6.1	6.2	6.4	6.7	6.7	7.0	6.9	6.9	7.0	6.4	6.0	5.5	4.9	4.6	4.3	4.1	4.4	4.6	4.7	4.6	4.5	4.4	4.2	3.9	3.9	4.2
9.5	9.5	9.8	9.9	10.0	10.2	10.5	10.8	11.1	11.1	11.1	11.0	11.2	11.4	11.6	12.0	12.4	12.6	12.5	12.3	12.1	11.9	11.6	11.2	10.8	10.5	10.8	11.1	11.0	10.9	10.9	10.7	10.1	9.5	9.3	9.4
13.7	13.6	13.8	14.0	14.0	14.0	14.1	14.3	14.5	14.6	14.5	14.7	14.5	14.5	14.7	15.0	15.4	16.0	16.6	16.7	16.7	16.8	16.9	17.3	16.6	16.6	17.0	16.3	16.5	16.4	16.6	17.0	16.1	15.4	14.4	13.9
17.0	17.2	17.2	17.2	17.1	17.1	17.2	17.4	17.5	17.4	17.2	17.1	17.2	17.2	17.1	17.3	17.4	17.8	18.3	18.7	19.2	19.8	20.2	20.6	20.6	20.4	20.4	20.4	19.7	19.3	19.0	18.5	17.9	17.4	17.1	17.1

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.5	1.5	1.5	1.6	1.7	1.7	1.7	1.7	1.8	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5
1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.1	1.4	1.1	1.2	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3
1.2	1.2	1.1	1.2	1.2	1.3	1.4	1.3	1.2	1.0	1.0	1.1	1.2	1.4	1.5	1.6	1.6	1.5	1.2	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.5	1.5	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.2
1.3	1.2	1.2	1.2	1.1	1.2	1.4	1.4	1.3	1.1	1.1	1.2	1.2	1.3	1.5	1.5	1.5	1.3	1.3	1.2	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.1	1.2	1.2	1.2	1.3	1.5
1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.5	1.5	1.4	1.5	1.4	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.4	1.5	1.4	1.4	1.5	1.5	1.6	1.6	1.5
1.8	1.7	1.7	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.7	1.8	1.8	1.7	1.8	1.7	1.7	1.8	1.6	2.0	2.0	1.9	2.0	2.0	1.9	2.0	1.8	1.9	1.9	1.8	2.0	2.0	1.9	1.9	1.8
1.9	1.8	1.8	1.9	1.9	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	1.9	2.2	2.1	2.1	2.2	2.2	2.3	2.0	2.2	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9
2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.0	2.1	2.0	2.0
2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	1.9	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0
2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0
2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	1.9	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0
1.6	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.9	1.9	1.7	1.9	1.8	1.8	1.8	1.8	1.9	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0	1.8	1.9	1.8	1.9	1.8
1.2	1.4	1.5	1.4	1.5	1.4	1.6	1.7	1.7	1.7	1.8	1.8	1.7	1.6	1.7	1.7	1.7	1.6	1.7	1.7	1.5	1.6	1.7	1.6	1.7	1.8	1.8	1.7	1.6	1.6	1.6	1.4	1.4	1.5	1.5	1.4
1.6	1.8	1.9	1.8	1.9	1.9	2.0	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.3	2.3	2.3	2.4	2.2	2.3	2.3	2.4	2.4	2.6	2.7	2.7	2.6	2.6	2.5	2.3	2.1	2.0	1.9	1.8	1.7
2.5	2.5	2.5	2.7	2.7	2.8	2.9	3.0	3.0	3.0	2.9	2.8	2.9	2.8	2.9	3.0	3.1	3.1	3.2	3.1	3.1	3.1	3.2	3.3	3.5	3.8	4.0	4.0	3.9	4.0	3.8	3.4	3.1	2.8	2.6	2.4
2.7	2.8	2.7	2.7	2.6	2.6	2.6	2.7	2.9	2.9	2.9	2.9	2.9	2.7	2.8	2.7	2.7	2.7	2.7	2.6	2.7	2.7	2.9	3.1	3.3	3.6	3.9	4.0	3.9	3.8	3.8	3.6	3.4	3.1	2.8	2.8
2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.0	1.9	1.9	2.0	2.1	2.2	2.1	2.0	1.9	2.2	2.4	2.4	2.5	2.7	2.6	2.5	2.1	2.1	1.9	2.0	2.1
2.1	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.4	2.3	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.3	1.1	1.2	1.4	1.5	1.6	1.7	1.6	1.6	1.7	1.8	1.9	2.1	2.1

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

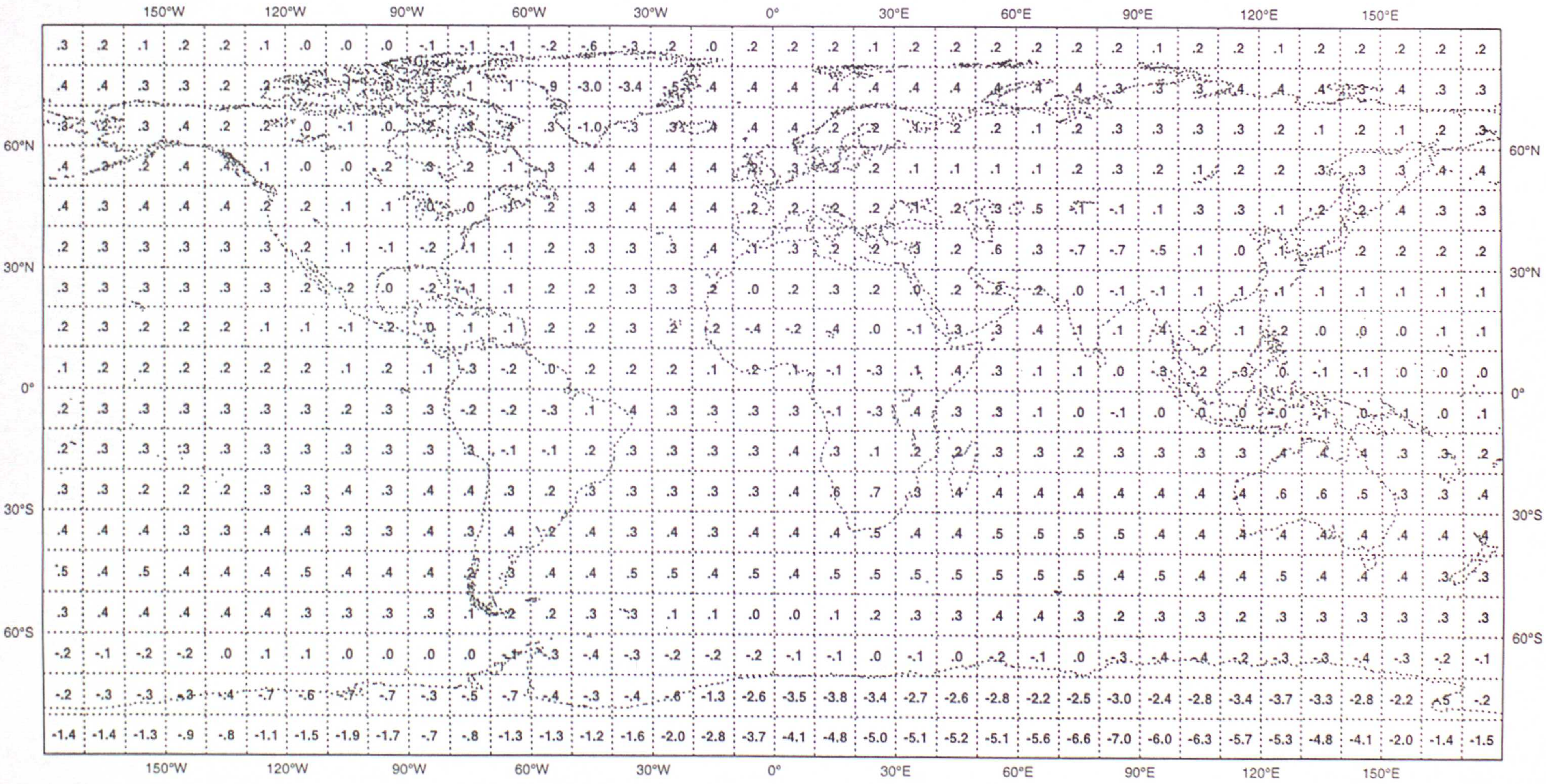
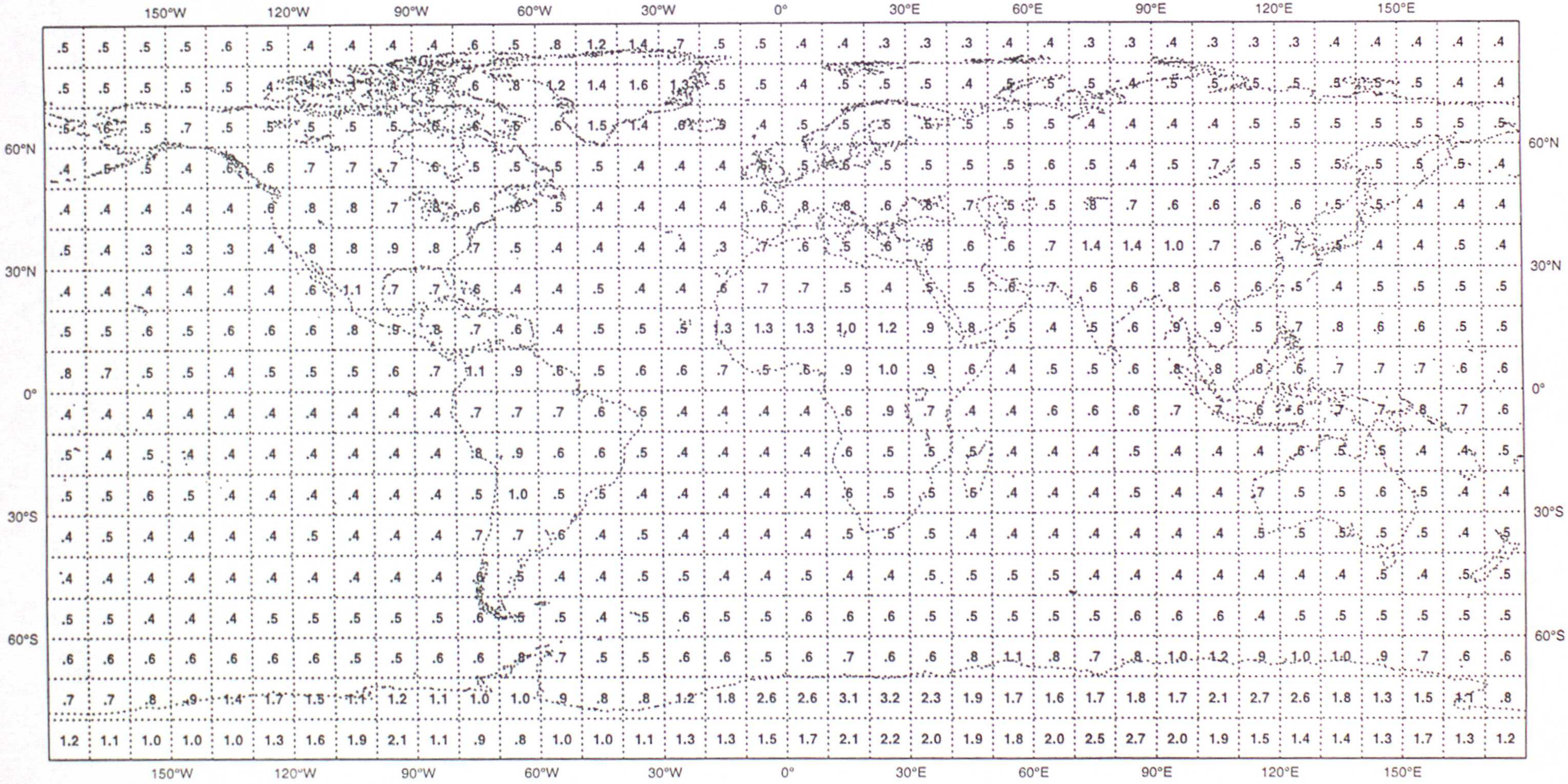

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .2 .1 .2 .2 .1 .0 .0 .0 -.1 -.1 -.1 -.2 -.6 -.3 .2 .0 .2 .2 .2 .1 .2 .2 .2 .2 .2 .2 .1 .2 .2 .1 .2 .2 .2 .2 .2
.4 .4 .3 .3 .2 .2 [illegible] [illegible] .0 [illegible] .1 .1 .9 -3.0 -3.4 -.5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .3 .4 .3 .3
.3 .2 .3 .4 .2 .2 .0 -.1 .0 .2 .3 .4 .3 -1.0 -.3 .3 .4 .4 .4 .2 .2 .1 .2 .2 .1 .2 .3 .3 .3 .3 .2 .1 .2 .1 .2 .3
.4 .3 .2 .4 .4 .1 .0 .0 .2 .3 .2 .1 .3 .4 .4 .4 .4 .2 .3 .2 .2 .1 .1 .1 .1 .2 .3 .2 .1 .2 .2 .3 .3 .3 .4 .4
.4 .3 .4 .4 .4 .2 .2 .1 .1 .0 .0 .1 .2 .3 .4 .4 .4 .2 .2 .2 .2 .1 .2 .3 .5 .1 -.1 .1 .3 .3 .1 .2 .2 .4 .3 .3
.2 .3 .3 .3 .3 .3 .2 .1 -.1 -.2 .1 .1 .2 .3 .3 .3 .4 .1 .3 .2 .2 .3 .2 .6 .3 -.7 -.7 -.5 .1 .0 .1 .1 .2 .2 .2 .2
.3 .3 .3 .3 .3 .3 .2 -.2 .0 -.2 -.1 .1 .2 .2 .3 .3 .2 .0 .2 .3 .2 .0 .2 .2 .2 .0 -.1 -.1 .1 .1 .1 .1 .1 .1 .1 .1
.2 .3 .2 .2 .2 .1 .1 -.1 -.2 .0 .1 .1 .2 .2 .3 .2 .2 -.4 -.2 .4 .0 -.1 .3 .3 .4 .1 .1 -.4 -.2 .1 -.2 .0 .0 .0 .1 .1
.1 .2 .2 .2 .2 .2 .2 .1 .2 .1 -.3 -.2 .0 .2 .2 .2 .1 .2 .1 -.1 -.3 .1 .4 .3 .1 .1 .0 -.3 -.2 -.3 .0 -.1 -.1 .0 .0 .0
.2 .3 .3 .3 .3 .3 .3 .2 .3 .3 -.2 -.2 -.3 .1 .4 .3 .3 .3 .3 -.1 -.3 .4 .3 .3 .1 .0 -.1 .0 .0 .0 .0 -.1 .0 -.1 .0 .1
.2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 -.1 -.1 .2 .3 .3 .3 .3 .4 .3 .1 .2 .2 .3 .3 .2 .3 .3 .3 .3 .4 .4 .4 .3 .3 .2
.3 .3 .2 .2 .2 .3 .3 .4 .3 .4 .4 .3 .2 .3 .3 .3 .3 .3 .4 .6 .7 .3 .4 .4 .4 .4 .4 .4 .4 .4 .6 .6 .5 .3 .3 .4
.4 .4 .4 .3 .3 .4 .4 .3 .3 .4 .3 .4 .2 .4 .3 .4 .3 .4 .4 .4 .5 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .4 .5 .4 .4 .4 .5 .4 .4 .4 .2 .3 .4 .4 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .5 .4 .4 .4 .3 .3
.3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .1 .2 .2 .3 .3 .1 .1 .0 .0 .1 .2 .3 .3 .4 .4 .3 .2 .3 .3 .2 .3 .3 .3 .3 .3 .3
-.2 -.1 -.2 -.2 .0 .1 .1 .0 .0 .0 .0 -.1 -.3 -.4 -.3 -.2 -.2 -.2 -.1 -.1 .0 -.1 .0 -.2 -.1 .0 -.3 -.4 -.4 -.2 -.3 -.3 -.4 -.3 -.2 -.1
-.2 -.3 -.3 -.3 -.4 -.7 -.6 -.7 -.7 -.3 -.5 -.7 -.4 -.3 -.4 -.6 -1.3 -2.6 -3.5 -3.8 -3.4 -2.7 -2.6 -2.8 -2.2 -2.5 -3.0 -2.4 -2.8 -3.4 -3.7 -3.3 -2.8 -2.2 -.5 -.2
-1.4 -1.4 -1.3 -.9 -.8 -1.1 -1.5 -1.9 -1.7 -.7 -.8 -1.3 -1.3 -1.2 -1.6 -2.0 -2.8 -3.7 -4.1 -4.8 -5.0 -5.1 -5.2 -5.1 -5.6 -6.6 -7.0 -6.0 -6.3 -5.7 -5.3 -4.8 -4.1 -2.0 -1.4 -1.5

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.5	.5	.5	.5	.6	.5	.4	.4	.4	.4	.6	.5	.8	1.2	1.4	.7	.5	.5	.4	.4	.3	.3	.3	.4	.4	.3	.3	.4	.3	.3	.3	.4	.4	.4	.4	.4
.5	.5	.5	.5	.5	.4	.4	.3	.4	.4	.6	.8	1.2	1.4	1.6	1.3	.5	.5	.4	.5	.5	.5	.4	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4
.5	.6	.5	.7	.5	.5	.5	.5	.5	.6	.6	.5	.6	1.5	1.4	.6	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5
.4	.5	.5	.4	.6	.6	.7	.7	.7	.6	.5	.5	.5	.5	.4	.4	.4	.5	.5	.6	.5	.5	.5	.5	.6	.5	.4	.5	.7	.5	.5	.5	.5	.5	.5	.4
.4	.4	.4	.4	.4	.6	.8	.8	.7	.8	.6	.6	.5	.4	.4	.4	.4	.6	.8	.8	.6	.8	.7	.5	.5	.8	.7	.6	.6	.6	.6	.5	.5	.4	.4	.4
.5	.4	.3	.3	.3	.4	.8	.8	.9	.8	.7	.5	.4	.4	.4	.4	.3	.7	.6	.5	.6	.6	.6	.6	.7	1.4	1.4	1.0	.7	.6	.7	.5	.4	.4	.5	.4
.4	.4	.4	.4	.4	.4	.6	1.1	.7	.7	.6	.4	.4	.5	.4	.4	.6	.7	.7	.5	.4	.5	.5	.6	.7	.6	.6	.8	.6	.6	.5	.4	.5	.5	.5	.5
.5	.5	.6	.5	.6	.6	.6	.8	.9	.8	.7	.6	.4	.5	.5	.5	1.3	1.3	1.3	1.0	1.2	.9	.8	.5	.4	.5	.6	.9	.9	.5	.7	.8	.6	.6	.5	.5
.8	.7	.5	.5	.4	.5	.5	.5	.6	.7	1.1	.9	.6	.5	.6	.6	.7	.5	.6	.9	1.0	.9	.6	.4	.5	.5	.6	.8	.8	.8	.6	.7	.7	.7	.6	.6
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.7	.7	.7	.6	.5	.4	.4	.4	.4	.6	.9	.7	.4	.4	.6	.6	.6	.7	.7	.6	.6	.7	.7	.8	.7	.6
.5	.4	.5	.4	.4	.4	.4	.4	.4	.4	.8	.9	.6	.6	.5	.4	.4	.4	.4	.6	.5	.5	.5	.4	.4	.4	.5	.4	.4	.4	.6	.5	.5	.4	.4	.5
.5	.5	.6	.5	.4	.4	.4	.4	.4	.4	.5	1.0	.5	.5	.4	.4	.4	.4	.4	.6	.5	.5	.6	.4	.4	.4	.5	.4	.4	.7	.5	.5	.6	.5	.4	.4
.4	.5	.4	.4	.4	.4	.5	.4	.4	.4	.7	.7	.6	.4	.5	.4	.4	.4	.4	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.4	.5
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.6	.5	.4	.4	.5	.5	.4	.4	.5	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.5
.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.6	.5	.5	.4	.5	.6	.5	.5	.6	.6	.6	.5	.5	.5	.5	.5	.6	.6	.6	.4	.5	.5	.5	.5	.5	.5
.6	.6	.6	.6	.6	.6	.6	.5	.5	.6	.6	.8	.7	.5	.5	.6	.6	.5	.6	.7	.6	.6	.8	1.1	.8	.7	.8	1.0	1.2	.9	1.0	1.0	.9	.7	.6	.6
.7	.7	.8	.9	1.4	1.7	1.5	1.1	1.2	1.1	1.0	1.0	.9	.8	.8	1.2	1.8	2.6	2.6	3.1	3.2	2.3	1.9	1.7	1.6	1.7	1.8	1.7	2.1	2.7	2.6	1.8	1.3	1.5	1.1	.8
1.2	1.1	1.0	1.0	1.0	1.3	1.6	1.9	2.1	1.1	.9	.8	1.0	1.0	1.1	1.3	1.3	1.5	1.7	2.1	2.2	2.0	1.9	1.8	2.0	2.5	2.7	2.0	1.9	1.5	1.4	1.4	1.3	1.7	1.3	1.2

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

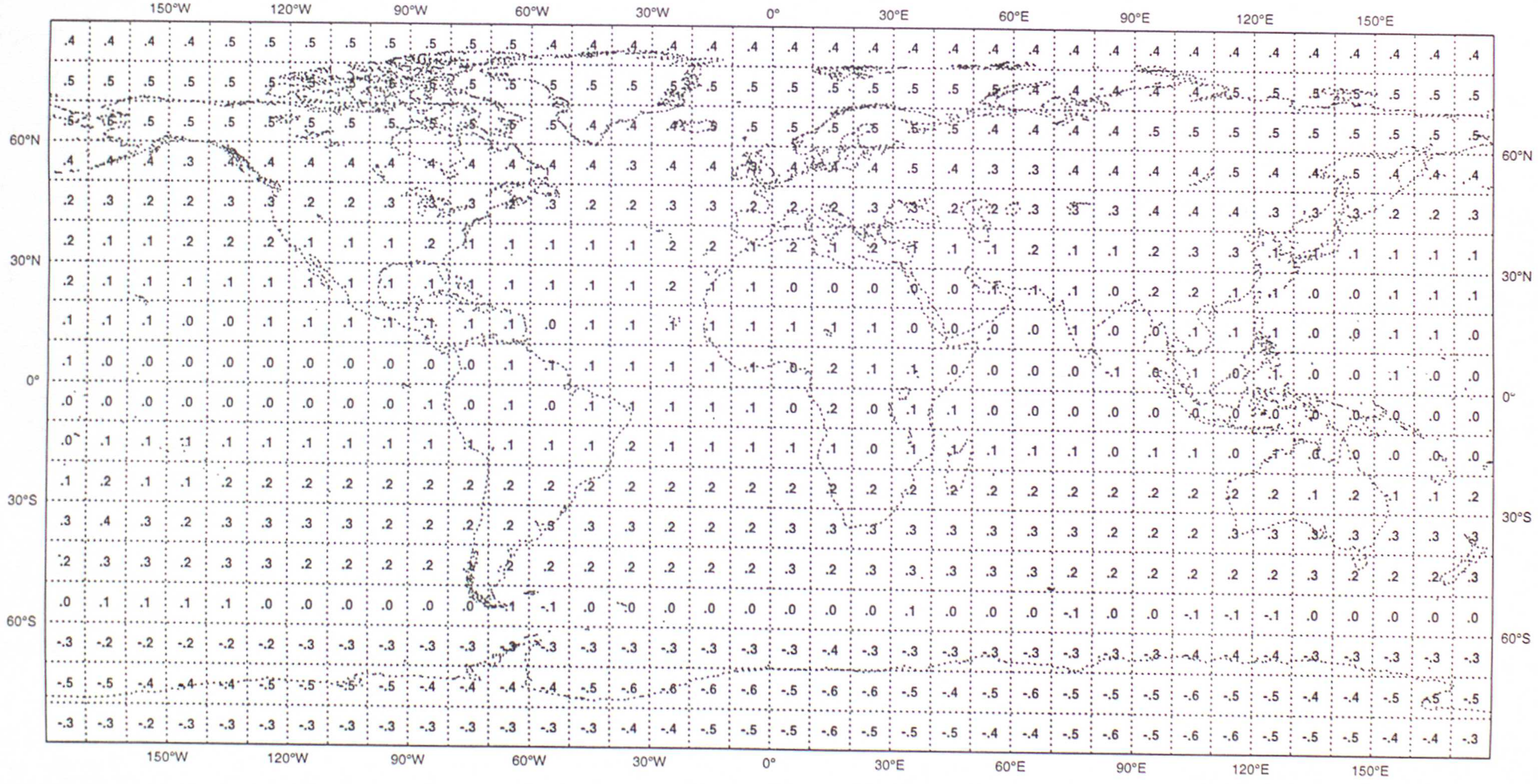

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
.4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5
.5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5
60°N
.4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .3 .4 .4 .4 .5 .4 .3 .3 .4 .4 .4 .4 .5 .4 .4 .5 .4 .4 .4
.2 .3 .2 .2 .3 .3 .2 .2 .3 .3 .3 .2 .3 .2 .2 .3 .3 .2 .2 .2 .3 .3 .2 .2 .3 .3 .3 .4 .4 .4 .3 .3 .3 .2 .2 .3
.2 .1 .1 .2 .2 .2 .1 .1 .1 .2 .1 .1 .1 .1 .1 .2 .2 .1 .2 .1 .2 .1 .1 .1 .2 .1 .1 .2 .3 .3 .1 .1 .1 .1 .1 .1
30°N
.2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .0 .0 .0 .0 .0 .1 .1 .1 .0 .2 .2 .1 .1 .0 .0 .1 .1 .1
.1 .1 .1 .0 .0 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .0 .0 .1 .1 .1 .0 .0 .1 .1 .0
.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .1 .1 .1 .1 .1 .1 .0 .2 .1 .1 .0 .0 .0 .0 -.1 .0 .1 .0 .1 .0 .0 .1 .0 .0
0°
.0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .1 .0 .1 .1 .1 .1 .1 .0 .2 .0 .1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0
.0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .0 .1 .1 .1 .1 .1 .0 .1 .1 .0 .1 .0 .0 .0 .0 .0
.1 .2 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .1 .1 .2
30°S
.3 .4 .3 .2 .3 .3 .3 .3 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3
.2 .3 .3 .2 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .2 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .3 .2 .2 .2 .3
.0 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 -.1 -.1 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .0 -.1 .0 .0 -.1 -.1 -.1 .0 .0 .0 .0 .0
60°S
-.3 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.3
-.5 -.5 -.4 -.4 -.4 -.5 -.5 -.5 -.5 -.4 -.4 -.4 -.4 -.5 -.6 -.6 -.6 -.6 -.5 -.6 -.6 -.5 -.4 -.5 -.6 -.5 -.5 -.5 -.6 -.5 -.5 -.4 -.4 -.5 -.5 -.5
-.3 -.3 -.2 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.5 -.5 -.5 -.6 -.5 -.5 -.5 -.4 -.4 -.5 -.6 -.5 -.6 -.6 -.5 -.5 -.5 -.4 -.4 -.3
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

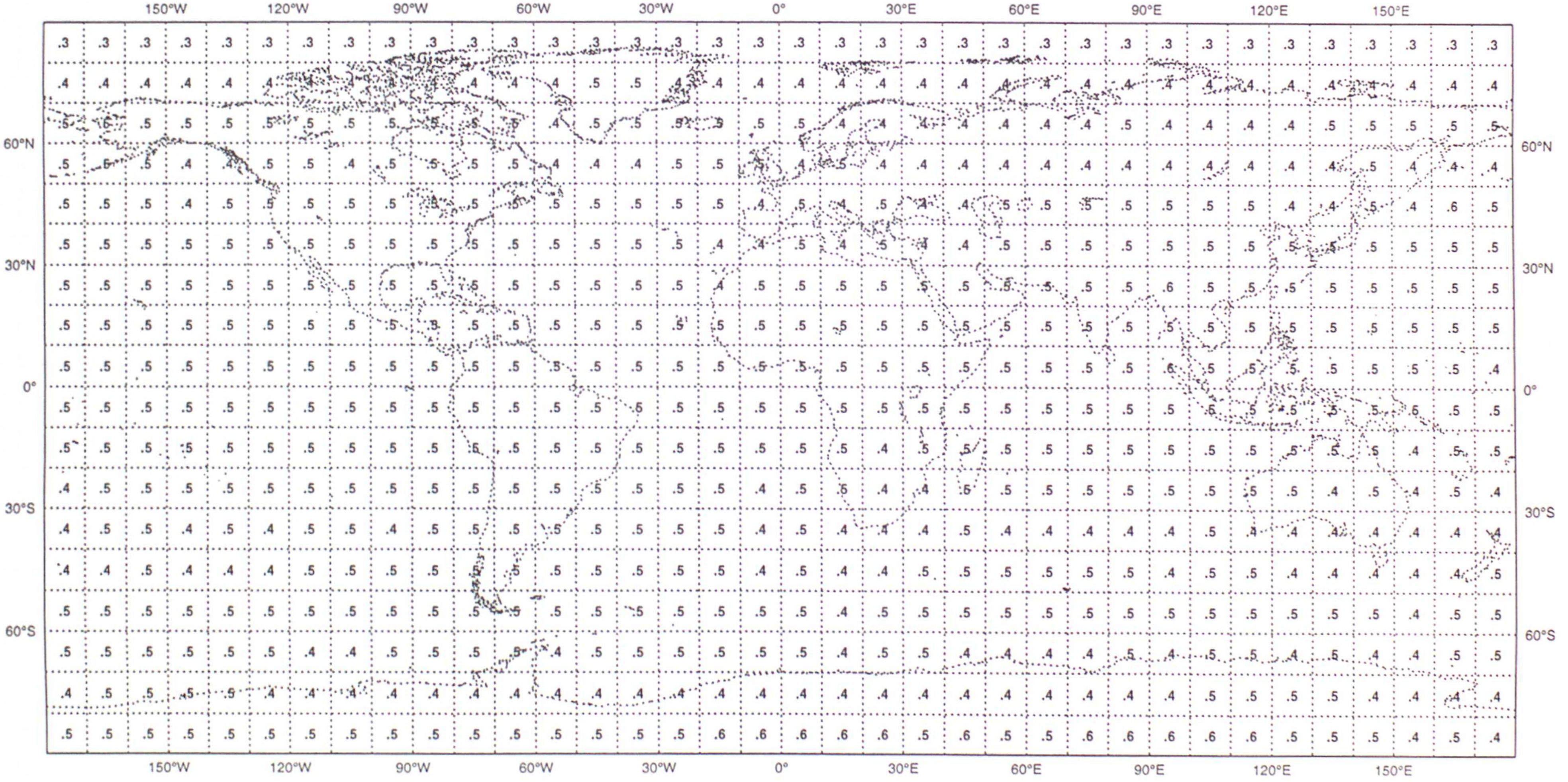

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5
.5 .6 .5 .4 .4 .5 .5 .4 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4
.5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .6 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .6 .4 .4 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .4
.4 .5 .5 .4 .5 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .4 .5 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4
.4 .4 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .4 .5 .5 .4 .4 .4 .4 .4 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .4 .5 .5 .4 .4 .4 .4 .5 .4 .5 .5 .4 .5 .4 .4 .5 .5
.4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .5 .6 .5 .5 .6 .6 .6 .6 .6 .5 .5 .5 .4 .5 .4

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

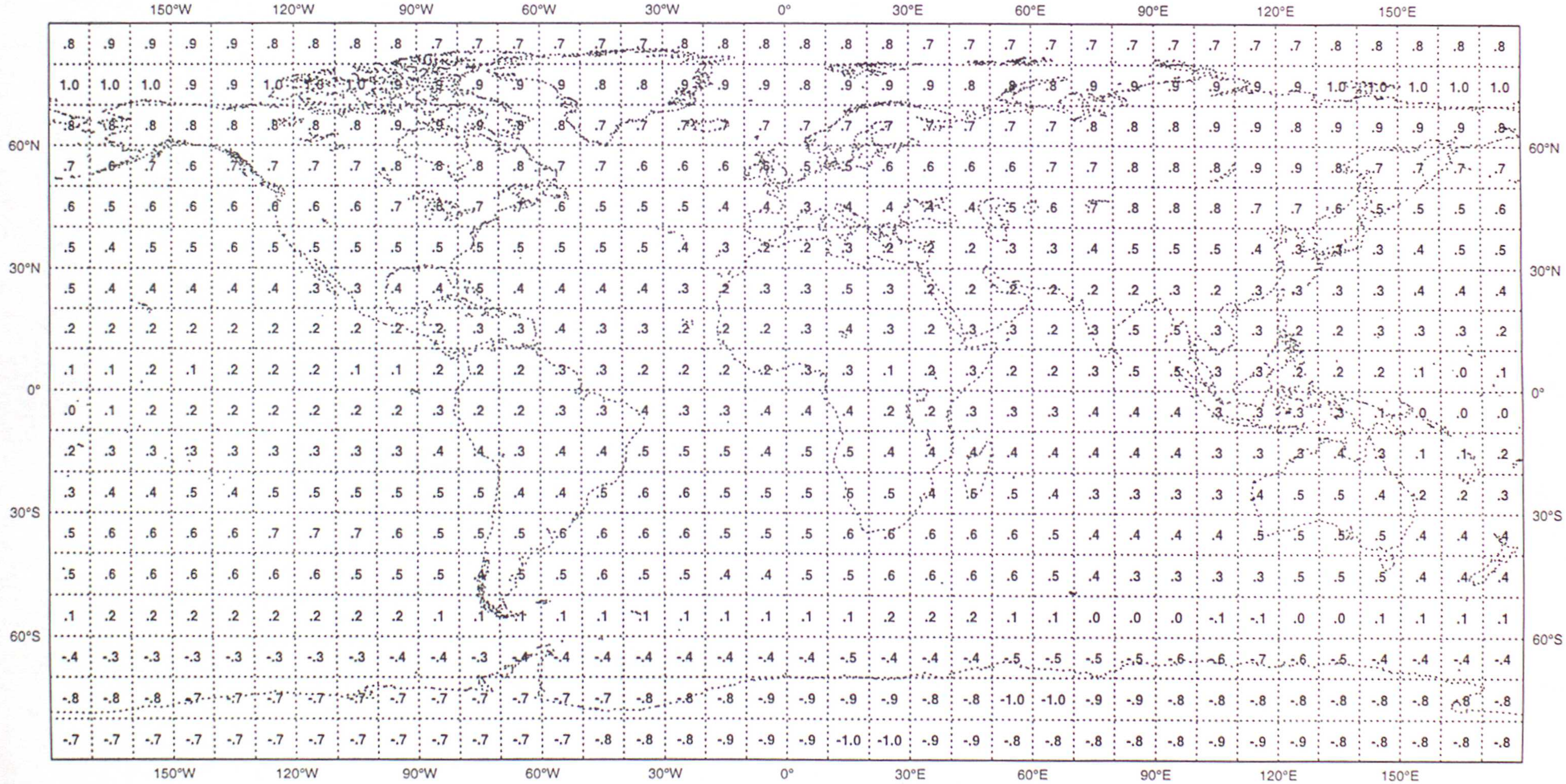

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.8 .9 .9 .9 .9 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8
1.0 1.0 1.0 .9 .9 1.0 1.0 1.0 .9 .9 .9 .9 .9 .8 .8 .9 .9 .9 .8 .9 .9 .9 .8 .8 .8 .9 .9 .9 .9 .9 .9 1.0 1.0 1.0 1.0 1.0
.8 .8 .8 .8 .8 .8 .8 .8 .9 .9 .9 .8 .8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .9 .9 .8 .9 .9 .9 .9 .8
.7 .6 .7 .6 .7 .7 .7 .7 .8 .8 .8 .8 .7 .7 .6 .6 .6 .6 .5 .5 .6 .6 .6 .6 .7 .7 .8 .8 .8 .9 .9 .8 .7 .7 .7 .7
.6 .5 .6 .6 .6 .6 .6 .6 .7 .6 .7 .7 .6 .5 .5 .5 .4 .4 .3 .4 .4 .4 .4 .5 .6 .7 .8 .8 .8 .7 .7 .6 .5 .5 .5 .6
.5 .4 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .3 .2 .2 .3 .2 .2 .2 .3 .3 .4 .5 .5 .5 .4 .3 .3 .3 .4 .5 .5
.5 .4 .4 .4 .4 .4 .3 .3 .4 .4 .5 .4 .4 .4 .4 .3 .2 .3 .3 .5 .3 .2 .2 .2 .2 .2 .2 .3 .2 .3 .3 .3 .3 .4 .4 .4
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .4 .3 .3 .2 .2 .2 .3 .4 .3 .2 .3 .3 .2 .3 .5 .5 .3 .3 .2 .2 .3 .3 .3 .2
.1 .1 .2 .1 .2 .2 .2 .1 .1 .2 .2 .2 .3 .3 .2 .2 .2 .2 .3 .3 .1 .2 .3 .2 .2 .3 .5 .5 .3 .3 .2 .2 .2 .1 .0 .1
.0 .1 .2 .2 .2 .2 .2 .2 .2 .3 .2 .2 .3 .3 .4 .3 .3 .4 .4 .4 .2 .2 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .1 .0 .0 .0
.2 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .4 .5 .5 .5 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .3 .1 .1 .2
.3 .4 .4 .5 .4 .5 .5 .5 .5 .5 .5 .4 .4 .5 .6 .6 .5 .5 .5 .6 .5 .4 .6 .5 .4 .3 .3 .3 .3 .4 .5 .5 .4 .2 .2 .3
.5 .6 .6 .6 .6 .7 .7 .7 .6 .5 .5 .5 .6 .6 .6 .6 .5 .5 .5 .6 .6 .6 .6 .6 .5 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4
.5 .6 .6 .6 .6 .6 .6 .5 .5 .5 .4 .5 .5 .6 .5 .5 .4 .4 .5 .5 .6 .6 .6 .6 .5 .4 .3 .3 .3 .3 .5 .5 .5 .4 .4 .4
.1 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .1 .1 .0 .0 .0 -.1 -.1 .0 .0 .1 .1 .1 .1
-.4 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.5 -.4 -.4 -.4 -.5 -.5 -.5 -.5 -.6 -.6 -.7 -.6 -.5 -.4 -.4 -.4 -.4
-.8 -.8 -.8 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.8 -.8 -.8 -.9 -.9 -.9 -.9 -.8 -.8 -1.0 -1.0 -.9 -.9 -.8 -.8 -.8 -.8 -.8 -.8 -.8 -.8 -.8
-.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.8 -.8 -.8 -.9 -.9 -.9 -1.0 -1.0 -.9 -.9 -.8 -.8 -.8 -.8 -.8 -.9 -.9 -.9 -.8 -.8 -.8 -.8 -.8

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

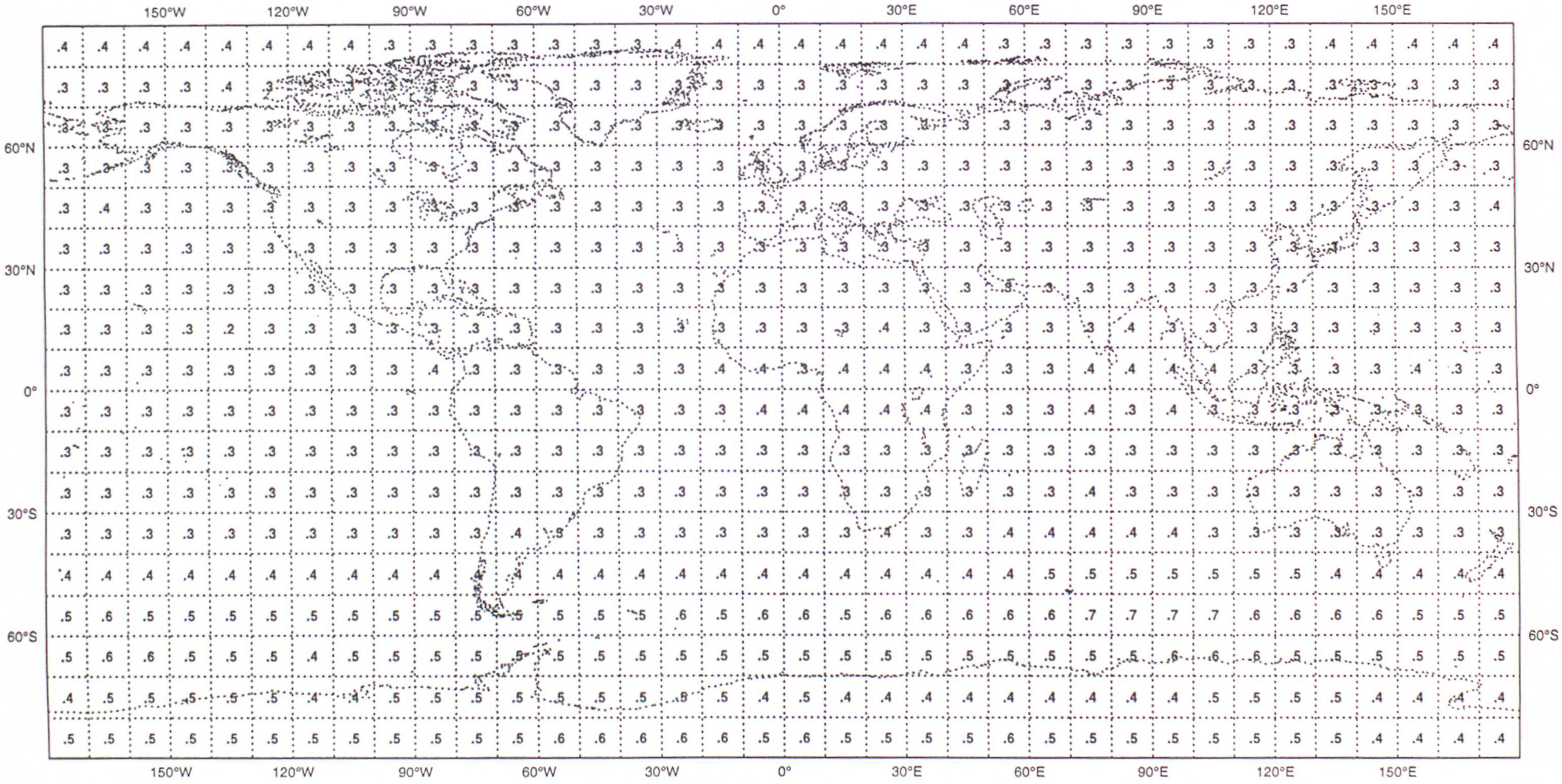
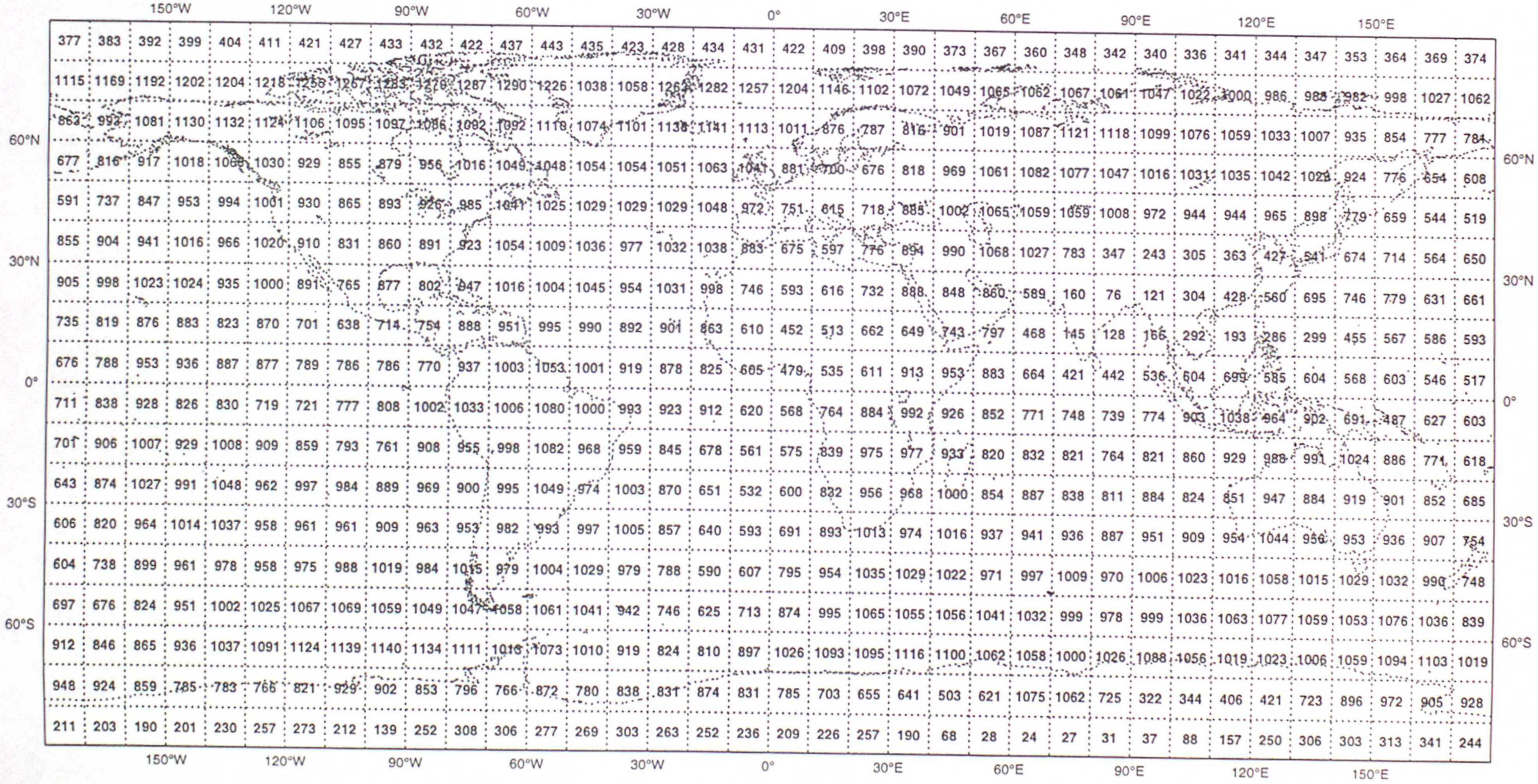

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4
.3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4
.5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .6 .6 .5 .6 .6 .6 .6 .6 .7 .7 .7 .7 .6 .6 .6 .6 .5 .5 .5
.5 .6 .6 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5
.4 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .5 .6 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4

Figure 40. ATOVS mean daily count. AUGUST 2003
NOAA16, using all observations
Global average number of observations in 24 hours = 530602



377	383	392	399	404	411	421	427	433	432	422	437	443	435	423	428	434	431	422	409	398	390	373	367	360	348	342	340	336	341	344	347	353	364	369	374
1115	1169	1192	1202	1204	1218	1258	1267	1283	1278	1287	1290	1226	1038	1058	1263	1282	1257	1204	1146	1102	1072	1049	1065	1062	1067	1061	1047	1022	1000	986	988	982	998	1027	1062
863	992	1081	1130	1132	1124	1106	1095	1097	1086	1092	1092	1110	1074	1101	1138	1141	1113	1011	876	787	816	901	1019	1087	1121	1118	1099	1076	1059	1033	1007	935	854	777	784
677	816	917	1018	1066	1030	929	855	879	956	1016	1049	1048	1054	1054	1051	1063	1041	881	700	676	818	969	1061	1082	1077	1047	1016	1031	1035	1042	1028	924	776	654	608
591	737	847	953	994	1001	930	865	893	926	985	1041	1025	1029	1029	1029	1048	972	751	615	718	885	1002	1065	1059	1059	1008	972	944	944	965	898	779	659	544	519
855	904	941	1016	966	1020	910	831	860	891	923	1054	1009	1036	977	1032	1038	883	675	597	776	894	990	1068	1027	783	347	243	305	363	427	541	674	714	564	650
905	998	1023	1024	935	1000	891	765	877	802	947	1016	1004	1045	954	1031	998	746	593	616	732	888	848	860	589	160	76	121	304	428	560	695	746	779	631	661
735	819	876	883	823	870	701	638	714	754	888	951	995	990	892	901	863	610	452	513	662	649	743	797	468	145	128	166	292	193	286	299	455	567	586	593
676	788	953	936	887	877	789	786	786	770	937	1003	1053	1001	919	878	825	605	479	535	611	913	953	883	664	421	442	536	604	699	585	604	568	603	546	517
711	838	928	826	830	719	721	777	808	1002	1033	1006	1080	1000	993	923	912	620	568	764	884	992	926	852	771	748	739	774	903	1038	964	902	691	487	627	603
701	906	1007	929	1008	909	859	793	761	908	955	998	1082	968	959	845	678	561	575	839	975	977	933	820	832	821	764	821	860	929	988	991	1024	886	771	618
643	874	1027	991	1048	962	997	984	889	969	900	995	1049	974	1003	870	651	532	600	832	956	968	1000	854	887	838	811	884	824	851	947	884	919	901	852	685
606	820	964	1014	1037	958	961	961	909	963	953	982	993	997	1005	857	640	593	691	893	1013	974	1016	937	941	936	887	951	909	954	1044	956	953	936	907	754
604	738	899	961	978	958	975	988	1019	984	1015	979	1004	1029	979	788	590	607	795	954	1035	1029	1022	971	997	1009	970	1006	1023	1016	1058	1015	1029	1032	990	748
697	676	824	951	1002	1025	1067	1069	1059	1049	1047	1058	1061	1041	942	746	625	713	874	995	1065	1055	1056	1041	1032	999	978	999	1036	1063	1077	1059	1053	1076	1036	839
912	846	865	936	1037	1091	1124	1139	1140	1134	1111	1016	1073	1010	919	824	810	897	1026	1093	1095	1116	1100	1062	1058	1000	1026	1088	1056	1019	1023	1006	1059	1094	1103	1019
948	924	859	785	783	766	821	929	902	853	796	766	872	780	838	831	874	831	785	703	655	641	503	621	1075	1062	725	322	344	406	421	723	896	972	905	928
211	203	190	201	230	257	273	212	139	252	308	306	277	269	303	263	252	236	209	226	257	190	68	28	24	27	31	37	88	157	250	306	303	313	341	244

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS8 (Surface)
NOAA16, using all observations

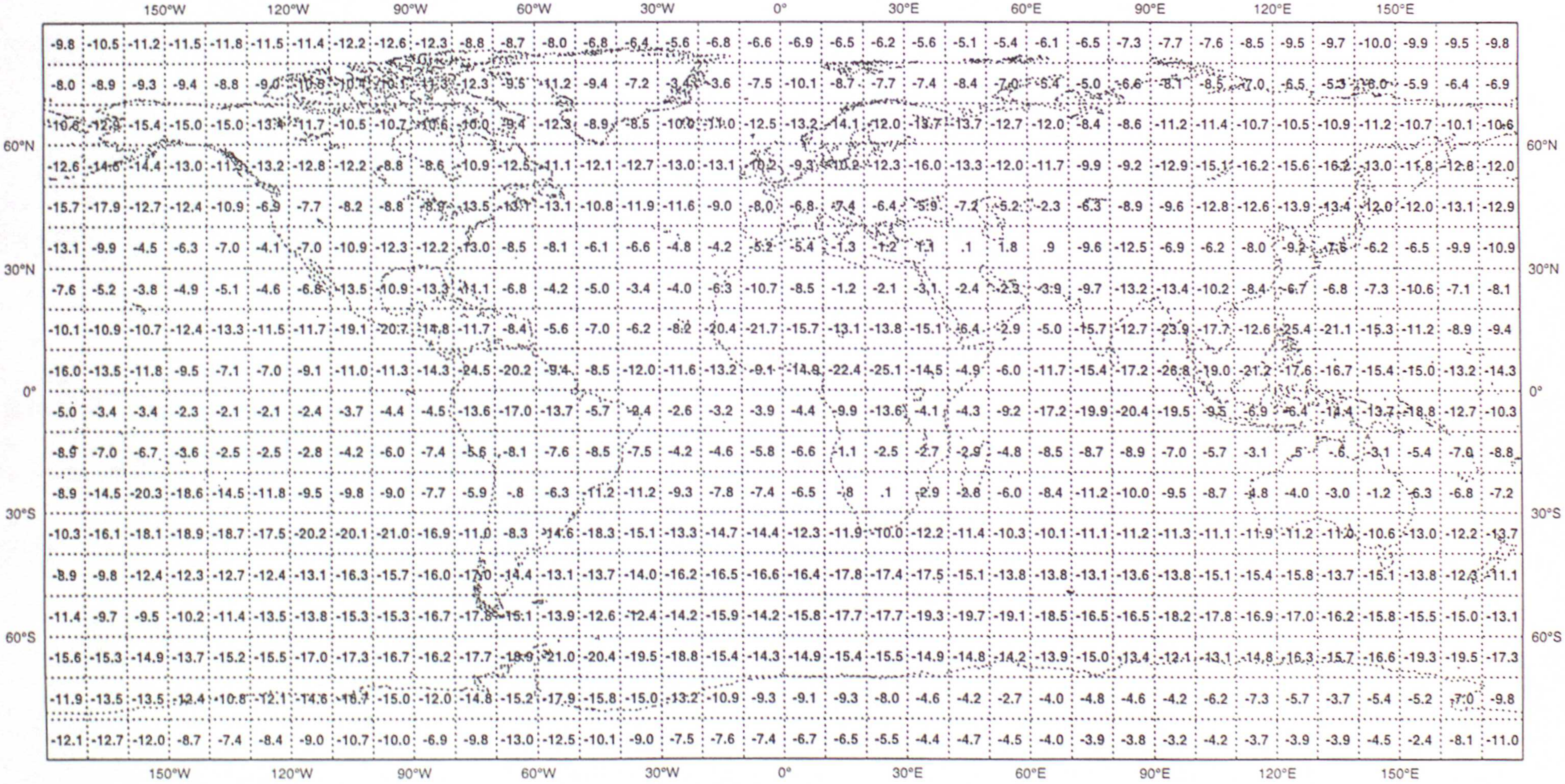
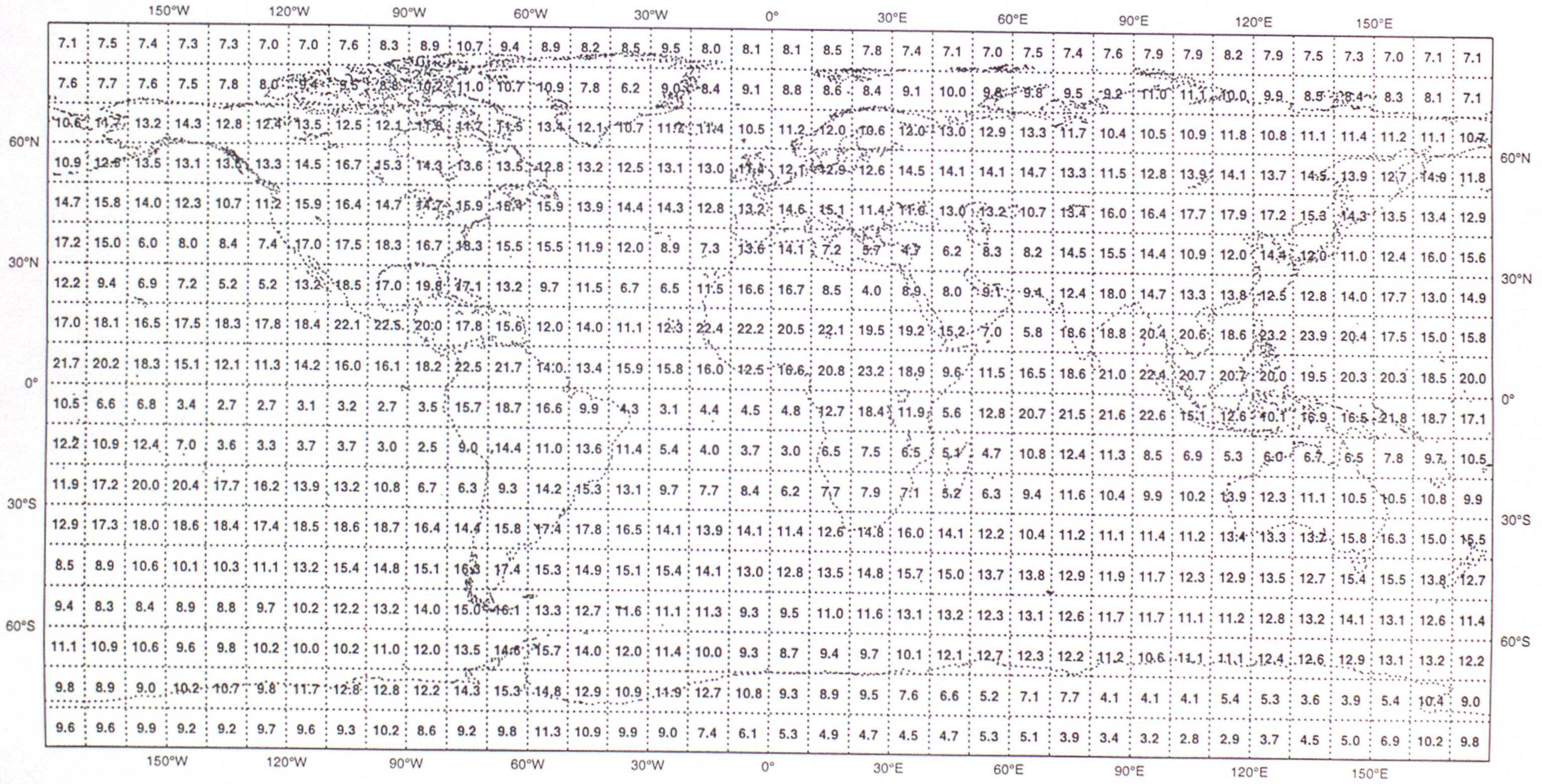
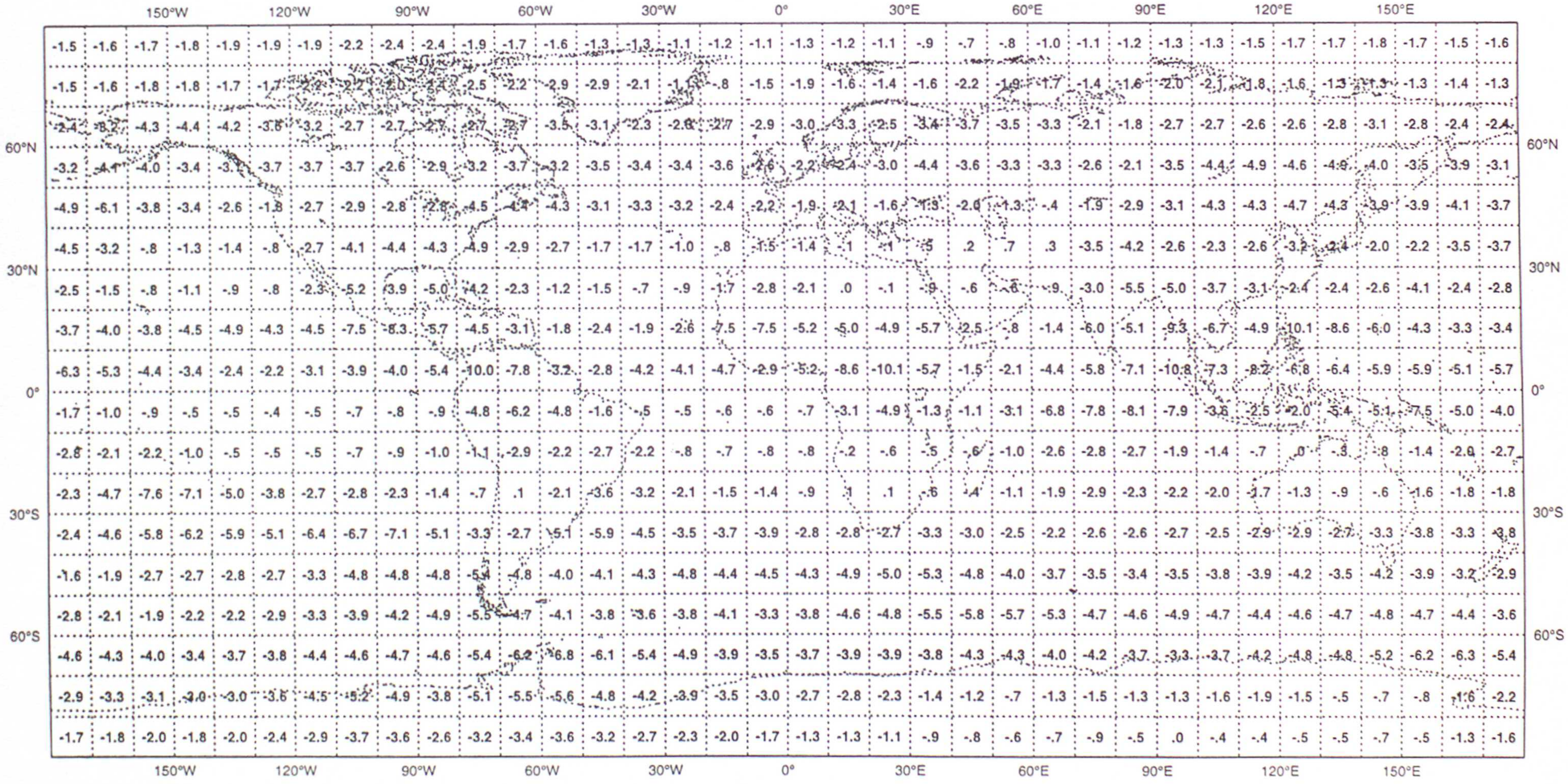

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-9.8 -10.5 -11.2 -11.5 -11.8 -11.5 -11.4 -12.2 -12.6 -12.3 -8.8 -8.7 -8.0 -6.8 -6.4 -5.6 -6.8 -6.6 -6.9 -6.5 -6.2 -5.6 -5.1 -5.4 -6.1 -6.5 -7.3 -7.7 -7.6 -8.5 -9.5 -9.7 -10.0 -9.9 -9.5 -9.8
-8.0 -8.9 -9.3 -9.4 -8.8 -9.0 -10.8 -10.4 -10.1 -11.3 -12.3 -9.5 -11.2 -9.4 -7.2 -3.4 -3.6 -7.5 -10.1 -8.7 -7.7 -7.4 -8.4 -7.0 -5.4 -5.0 -6.6 -8.1 -8.5 -7.0 -6.5 -5.3 -8.0 -5.9 -6.4 -6.9
-10.6 -12.9 -15.4 -15.0 -15.0 -13.4 -11.7 -10.5 -10.7 -10.6 -10.0 -9.4 -12.3 -8.9 -8.5 -10.0 -11.0 -12.5 -13.2 -14.1 -12.0 -13.7 -13.7 -12.7 -12.0 -8.4 -8.6 -11.2 -11.4 -10.7 -10.5 -10.9 -11.2 -10.7 -10.1 -10.6
-12.6 -14.6 -14.4 -13.0 -11.3 -13.2 -12.8 -12.2 -8.8 -8.6 -10.9 -12.5 -11.1 -12.1 -12.7 -13.0 -13.1 -10.2 -9.3 -10.2 -12.3 -16.0 -13.3 -12.0 -11.7 -9.9 -9.2 -12.9 -15.1 -16.2 -15.6 -16.2 -13.0 -11.8 -12.8 -12.0
-15.7 -17.9 -12.7 -12.4 -10.9 -6.9 -7.7 -8.2 -8.8 -8.9 -13.5 -13.1 -13.1 -10.8 -11.9 -11.6 -9.0 -8.0 -6.8 -7.4 -6.4 -5.9 -7.2 -5.2 -2.3 -6.3 -8.9 -9.6 -12.8 -12.6 -13.9 -13.4 -12.0 -12.0 -13.1 -12.9
-13.1 -9.9 -4.5 -6.3 -7.0 -4.1 -7.0 -10.9 -12.3 -12.2 -13.0 -8.5 -8.1 -6.1 -6.6 -4.8 -4.2 -5.2 -5.4 -1.3 -1.2 1.1 .1 1.8 .9 -9.6 -12.5 -6.9 -6.2 -8.0 -9.2 -7.6 -6.2 -6.5 -9.9 -10.9
-7.6 -5.2 -3.8 -4.9 -5.1 -4.6 -6.6 -13.5 -10.9 -13.3 -11.1 -6.8 -4.2 -5.0 -3.4 -4.0 -6.3 -10.7 -8.5 -1.2 -2.1 -3.1 -2.4 -2.3 -3.9 -9.7 -13.2 -13.4 -10.2 -8.4 -6.7 -6.8 -7.3 -10.6 -7.1 -8.1
-10.1 -10.9 -10.7 -12.4 -13.3 -11.5 -11.7 -19.1 -20.7 -14.8 -11.7 -8.4 -5.6 -7.0 -6.2 -8.2 -20.4 -21.7 -15.7 -13.1 -13.8 -15.1 -6.4 -2.9 -5.0 -15.7 -12.7 -23.9 -17.7 -12.6 -25.4 -21.1 -15.3 -11.2 -8.9 -9.4
-16.0 -13.5 -11.8 -9.5 -7.1 -7.0 -9.1 -11.0 -11.3 -14.3 -24.5 -20.2 -9.4 -8.5 -12.0 -11.6 -13.2 -9.1 -14.8 -22.4 -25.1 -14.5 -4.9 -6.0 -11.7 -15.4 -17.2 -26.8 -19.0 -21.2 -17.6 -16.7 -15.4 -15.0 -13.2 -14.3
-5.0 -3.4 -3.4 -2.3 -2.1 -2.1 -2.4 -3.7 -4.4 -4.5 -13.6 -17.0 -13.7 -5.7 -2.4 -2.6 -3.2 -3.9 -4.4 -9.9 -13.6 -4.1 -4.3 -9.2 -17.2 -19.9 -20.4 -19.5 -9.5 -6.9 -6.4 -14.4 -13.7 -18.8 -12.7 -10.3
-8.9 -7.0 -6.7 -3.6 -2.5 -2.5 -2.8 -4.2 -6.0 -7.4 -5.6 -8.1 -7.6 -8.5 -7.5 -4.2 -4.6 -5.8 -6.6 -1.1 -2.5 -2.7 -2.9 -4.8 -8.5 -8.7 -8.9 -7.0 -5.7 -3.1 .5 -.6 -3.1 -5.4 -7.0 -8.8
-8.9 -14.5 -20.3 -18.6 -14.5 -11.8 -9.5 -9.8 -9.0 -7.7 -5.9 -.8 -6.3 -11.2 -11.2 -9.3 -7.8 -7.4 -6.5 -.8 .1 -2.9 -2.8 -6.0 -8.4 -11.2 -10.0 -9.5 -8.7 -4.8 -4.0 -3.0 -1.2 -6.3 -6.8 -7.2
-10.3 -16.1 -18.1 -18.9 -18.7 -17.5 -20.2 -20.1 -21.0 -16.9 -11.0 -8.3 -14.6 -18.3 -15.1 -13.3 -14.7 -14.4 -12.3 -11.9 -10.0 -12.2 -11.4 -10.3 -10.1 -11.1 -11.2 -11.3 -11.1 -11.9 -11.2 -11.0 -10.6 -13.0 -12.2 -13.7
-8.9 -9.8 -12.4 -12.3 -12.7 -12.4 -13.1 -16.3 -15.7 -16.0 -17.0 -14.4 -13.1 -13.7 -14.0 -16.2 -16.5 -16.6 -16.4 -17.8 -17.4 -17.5 -15.1 -13.8 -13.8 -13.1 -13.6 -13.8 -15.1 -15.4 -15.8 -13.7 -15.1 -13.8 -12.3 -11.1
-11.4 -9.7 -9.5 -10.2 -11.4 -13.5 -13.8 -15.3 -15.3 -16.7 -17.8 -15.1 -13.9 -12.6 -12.4 -14.2 -15.9 -14.2 -15.8 -17.7 -17.7 -19.3 -19.7 -19.1 -18.5 -16.5 -16.5 -18.2 -17.8 -16.9 -17.0 -16.2 -15.8 -15.5 -15.0 -13.1
-15.6 -15.3 -14.9 -13.7 -15.2 -15.5 -17.0 -17.3 -16.7 -16.2 -17.7 -18.9 -21.0 -20.4 -19.5 -18.8 -15.4 -14.3 -14.9 -15.4 -15.5 -14.9 -14.8 -14.2 -13.9 -15.0 -13.4 -12.1 -13.1 -14.8 -16.3 -15.7 -16.6 -19.3 -19.5 -17.3
-11.9 -13.5 -13.5 -12.4 -10.8 -12.1 -14.6 -16.7 -15.0 -12.0 -14.8 -15.2 -17.9 -15.8 -15.0 -13.2 -10.9 -9.3 -9.1 -9.3 -8.0 -4.6 -4.2 -2.7 -4.0 -4.8 -4.6 -4.2 -6.2 -7.3 -5.7 -3.7 -5.4 -5.2 -7.0 -9.8
-12.1 -12.7 -12.0 -8.7 -7.4 -8.4 -9.0 -10.7 -10.0 -6.9 -9.8 -13.0 -12.5 -10.1 -9.0 -7.5 -7.6 -7.4 -6.7 -6.5 -5.5 -4.4 -4.7 -4.5 -4.0 -3.9 -3.8 -3.2 -4.2 -3.7 -3.9 -3.9 -4.5 -2.4 -8.1 -11.0

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS8 (Surface)
NOAA16, using all observations



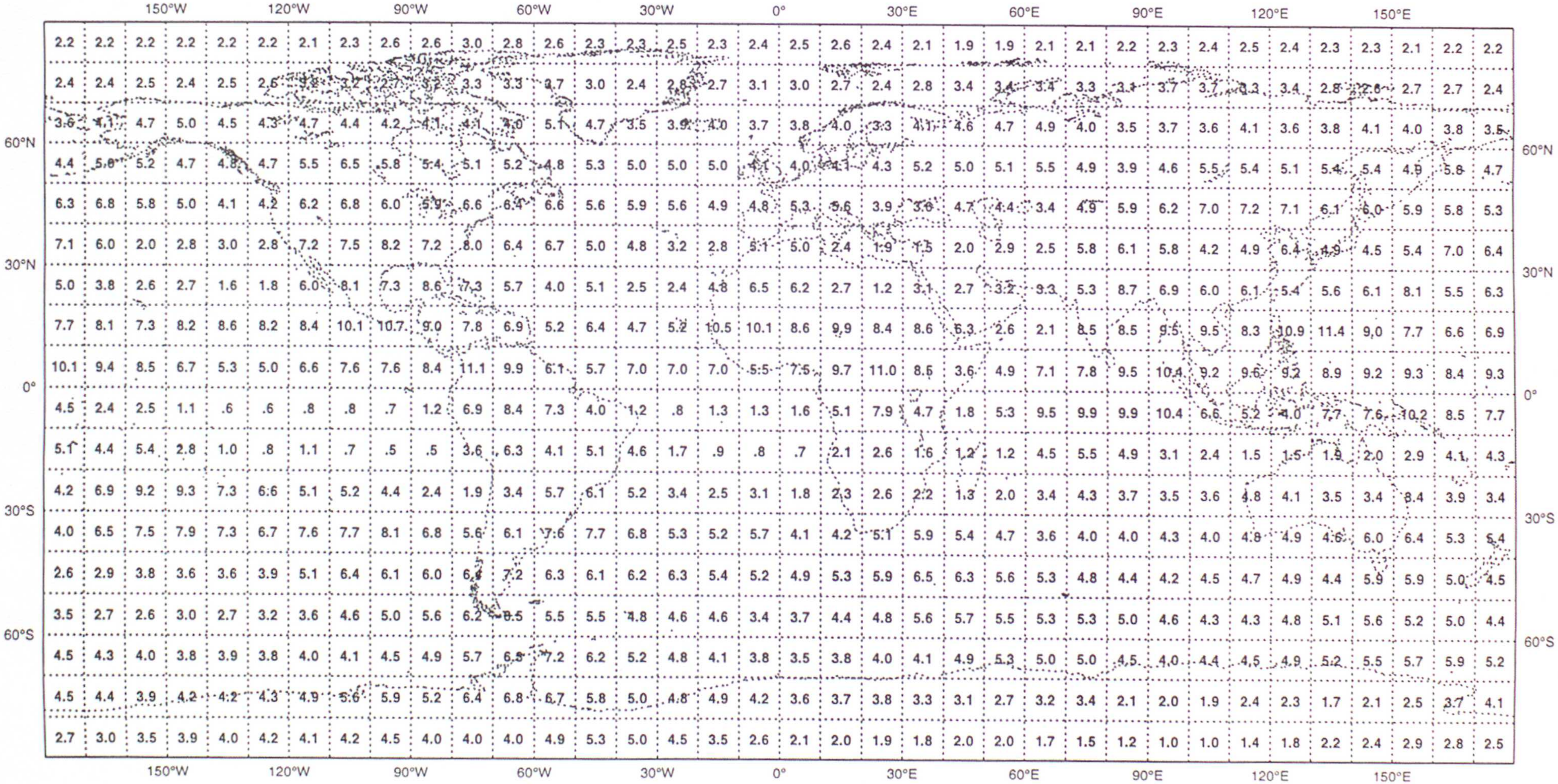
7.1	7.5	7.4	7.3	7.3	7.0	7.0	7.6	8.3	8.9	10.7	9.4	8.9	8.2	8.5	9.5	8.0	8.1	8.1	8.5	7.8	7.4	7.1	7.0	7.5	7.4	7.6	7.9	7.9	8.2	7.9	7.5	7.3	7.0	7.1	7.1
7.6	7.7	7.6	7.5	7.8	8.0	9.4	9.5	8.8	10.2	11.0	10.7	10.9	7.8	6.2	9.0	8.4	9.1	8.8	8.6	8.4	9.1	10.0	9.8	9.8	9.5	9.2	11.0	11.1	10.0	9.9	8.5	8.4	8.3	8.1	7.1
10.6	11.7	13.2	14.3	12.8	12.4	13.5	12.5	12.1	11.8	11.7	11.5	13.4	12.1	10.7	11.2	11.4	10.5	11.2	12.0	10.6	12.0	13.0	12.9	13.3	11.7	10.4	10.5	10.9	11.8	10.8	11.1	11.4	11.2	11.1	10.7
10.9	12.6	13.5	13.1	13.6	13.3	14.5	16.7	15.3	14.3	13.6	13.5	12.8	13.2	12.5	13.1	13.0	11.4	12.1	12.9	12.6	14.5	14.1	14.1	14.7	13.3	11.5	12.8	13.9	14.1	13.7	14.5	13.9	12.7	14.9	11.8
14.7	15.8	14.0	12.3	10.7	11.2	15.9	16.4	14.7	14.7	15.9	16.4	15.9	13.9	14.4	14.3	12.8	13.2	14.6	15.1	11.4	11.6	13.0	13.2	10.7	13.4	16.0	16.4	17.7	17.9	17.2	15.3	14.3	13.5	13.4	12.9
17.2	15.0	6.0	8.0	8.4	7.4	17.0	17.5	18.3	16.7	18.3	15.5	15.5	11.9	12.0	8.9	7.3	13.6	14.1	7.2	5.7	4.7	6.2	8.3	8.2	14.5	15.5	14.4	10.9	12.0	14.4	12.0	11.0	12.4	16.0	15.6
12.2	9.4	6.9	7.2	5.2	5.2	13.2	18.5	17.0	19.8	17.1	13.2	9.7	11.5	6.7	6.5	11.5	16.6	16.7	8.5	4.0	8.9	8.0	9.1	9.4	12.4	18.0	14.7	13.3	13.8	12.5	12.8	14.0	17.7	13.0	14.9
17.0	18.1	16.5	17.5	18.3	17.8	18.4	22.1	22.5	20.0	17.8	15.6	12.0	14.0	11.1	12.3	22.4	22.2	20.5	22.1	19.5	19.2	15.2	7.0	5.8	18.6	18.8	20.4	20.6	18.6	23.2	23.9	20.4	17.5	15.0	15.8
21.7	20.2	18.3	15.1	12.1	11.3	14.2	16.0	16.1	18.2	22.5	21.7	14.0	13.4	15.9	15.8	16.0	12.5	16.6	20.8	23.2	18.9	9.6	11.5	16.5	18.6	21.0	22.4	20.7	20.7	20.0	19.5	20.3	20.3	18.5	20.0
10.5	6.6	6.8	3.4	2.7	2.7	3.1	3.2	2.7	3.5	15.7	18.7	16.6	9.9	4.3	3.1	4.4	4.5	4.8	12.7	18.4	11.9	5.6	12.8	20.7	21.5	21.6	22.6	15.1	12.6	10.1	16.9	16.5	21.8	18.7	17.1
12.2	10.9	12.4	7.0	3.6	3.3	3.7	3.7	3.0	2.5	9.0	14.4	11.0	13.6	11.4	5.4	4.0	3.7	3.0	6.5	7.5	6.5	5.1	4.7	10.8	12.4	11.3	8.5	6.9	5.3	6.0	6.7	6.5	7.8	9.7	10.5
11.9	17.2	20.0	20.4	17.7	16.2	13.9	13.2	10.8	6.7	6.3	9.3	14.2	15.3	13.1	9.7	7.7	8.4	6.2	7.7	7.9	7.1	5.2	6.3	9.4	11.6	10.4	9.9	10.2	13.9	12.3	11.1	10.5	10.5	10.8	9.9
12.9	17.3	18.0	18.6	18.4	17.4	18.5	18.6	18.7	16.4	14.4	15.8	17.4	17.8	16.5	14.1	13.9	14.1	11.4	12.6	14.8	16.0	14.1	12.2	10.4	11.2	11.1	11.4	11.2	13.4	13.3	13.2	15.8	16.3	15.0	15.5
8.5	8.9	10.6	10.1	10.3	11.1	13.2	15.4	14.8	15.1	16.3	17.4	15.3	14.9	15.1	15.4	14.1	13.0	12.8	13.5	14.8	15.7	15.0	13.7	13.8	12.9	11.9	11.7	12.3	12.9	13.5	12.7	15.4	15.5	13.8	12.7
9.4	8.3	8.4	8.9	8.8	9.7	10.2	12.2	13.2	14.0	15.0	16.1	13.3	12.7	11.6	11.1	11.3	9.3	9.5	11.0	11.6	13.1	13.2	12.3	13.1	12.6	11.7	11.7	11.1	11.2	12.8	13.2	14.1	13.1	12.6	11.4
11.1	10.9	10.6	9.6	9.8	10.2	10.0	10.2	11.0	12.0	13.5	14.6	15.7	14.0	12.0	11.4	10.0	9.3	8.7	9.4	9.7	10.1	12.1	12.7	12.3	12.2	11.2	10.6	11.1	11.1	12.4	12.6	12.9	13.1	13.2	12.2
9.8	8.9	9.0	10.2	10.7	9.8	11.7	12.8	12.8	12.2	14.3	15.3	14.8	12.9	10.9	11.9	12.7	10.8	9.3	8.9	9.5	7.6	6.6	5.2	7.1	7.7	4.1	4.1	4.1	5.4	5.3	3.6	3.9	5.4	10.4	9.0
9.6	9.6	9.9	9.2	9.2	9.7	9.6	9.3	10.2	8.6	9.2	9.8	11.3	10.9	9.9	9.0	7.4	6.1	5.3	4.9	4.7	4.5	4.7	5.3	5.1	3.9	3.4	3.2	2.8	2.9	3.7	4.5	5.0	6.9	10.2	9.8

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



-1.5	-1.6	-1.7	-1.8	-1.9	-1.9	-1.9	-2.2	-2.4	-2.4	-1.9	-1.7	-1.6	-1.3	-1.3	-1.1	-1.2	-1.1	-1.3	-1.2	-1.1	-.9	-.7	-.8	-1.0	-1.1	-1.2	-1.3	-1.3	-1.5	-1.7	-1.7	-1.8	-1.7	-1.5	-1.6
-1.5	-1.6	-1.8	-1.8	-1.7	-1.7	-2.2	-2.2	-2.0	-2.4	-2.5	-2.2	-2.9	-2.9	-2.1	-1.1	-.8	-1.5	-1.9	-1.6	-1.4	-1.6	-2.2	-1.9	-1.7	-1.4	-1.6	-2.0	-2.1	-1.8	-1.6	-1.3	-1.3	-1.3	-1.4	-1.3
-2.4	-3.2	-4.3	-4.4	-4.2	-3.6	-3.2	-2.7	-2.7	-2.7	-2.7	-2.7	-3.5	-3.1	-2.3	-2.6	-2.7	-2.9	-3.0	-3.3	-2.5	-3.4	-3.7	-3.5	-3.3	-2.1	-1.8	-2.7	-2.7	-2.6	-2.6	-2.8	-3.1	-2.8	-2.4	-2.4
-3.2	-4.1	-4.0	-3.4	-3.1	-3.7	-3.7	-3.7	-2.6	-2.9	-3.2	-3.7	-3.2	-3.5	-3.4	-3.4	-3.6	-2.6	-2.2	-2.4	-3.0	-4.4	-3.6	-3.3	-3.3	-2.6	-2.1	-3.5	-4.4	-4.9	-4.6	-4.9	-4.0	-3.5	-3.9	-3.1
-4.9	-6.1	-3.8	-3.4	-2.6	-1.8	-2.7	-2.9	-2.8	-2.8	-4.5	-4.4	-4.3	-3.1	-3.3	-3.2	-2.4	-2.2	-1.9	-2.1	-1.6	-1.3	-2.0	-1.3	-.4	-1.9	-2.9	-3.1	-4.3	-4.3	-4.7	-4.3	-3.9	-3.9	-4.1	-3.7
-4.5	-3.2	-.8	-1.3	-1.4	-.8	-2.7	-4.1	-4.4	-4.3	-4.9	-2.9	-2.7	-1.7	-1.7	-1.0	-.8	-1.5	-1.4	-.1	-.1	-.5	.2	.7	.3	-3.5	-4.2	-2.6	-2.3	-2.6	-3.2	-2.4	-2.0	-2.2	-3.5	-3.7
-2.5	-1.5	-.8	-1.1	-.9	-.8	-2.3	-5.2	-3.9	-5.0	-4.2	-2.3	-1.2	-1.5	-.7	-.9	-1.7	-2.8	-2.1	.0	-.1	-.9	-.6	-.6	-.9	-3.0	-5.5	-5.0	-3.7	-3.1	-2.4	-2.4	-2.6	-4.1	-2.4	-2.8
-3.7	-4.0	-3.8	-4.5	-4.9	-4.3	-4.5	-7.5	-8.3	-5.7	-4.5	-3.1	-1.8	-2.4	-1.9	-2.6	-7.5	-7.5	-5.2	-5.0	-4.9	-5.7	-2.5	-.8	-1.4	-6.0	-5.1	-9.3	-6.7	-4.9	-10.1	-8.6	-6.0	-4.3	-3.3	-3.4
-6.3	-5.3	-4.4	-3.4	-2.4	-2.2	-3.1	-3.9	-4.0	-5.4	-10.0	-7.8	-3.2	-2.8	-4.2	-4.1	-4.7	-2.9	-5.2	-8.6	-10.1	-5.7	-1.5	-2.1	-4.4	-5.8	-7.1	-10.8	-7.3	-8.2	-6.8	-6.4	-5.9	-5.9	-5.1	-5.7
-1.7	-1.0	-.9	-.5	-.5	-.4	-.5	-.7	-.8	-.9	-4.8	-6.2	-4.8	-1.6	-.5	-.5	-.6	-.6	-.7	-3.1	-4.9	-1.3	-1.1	-3.1	-6.8	-7.8	-8.1	-7.9	-3.6	-2.5	-2.0	-5.4	-5.1	-7.5	-5.0	-4.0
-2.8	-2.1	-2.2	-1.0	-.5	-.5	-.5	-.7	-.9	-1.0	-1.1	-2.9	-2.2	-2.7	-2.2	-.8	-.7	-.8	-.8	-.2	-.6	-.5	-.6	-1.0	-2.6	-2.8	-2.7	-1.9	-1.4	-.7	.0	-.3	-.8	-1.4	-2.0	-2.7
-2.3	-4.7	-7.6	-7.1	-5.0	-3.8	-2.7	-2.8	-2.3	-1.4	-.7	.1	-2.1	-3.6	-3.2	-2.1	-1.5	-1.4	-.9	.1	.1	-.6	-.4	-1.1	-1.9	-2.9	-2.3	-2.2	-2.0	-1.7	-1.3	-.9	-.6	-1.6	-1.8	-1.8
-2.4	-4.6	-5.8	-6.2	-5.9	-5.1	-6.4	-6.7	-7.1	-5.1	-3.3	-2.7	-5.1	-5.9	-4.5	-3.5	-3.7	-3.9	-2.8	-2.8	-2.7	-3.3	-3.0	-2.5	-2.2	-2.6	-2.6	-2.7	-2.5	-2.9	-2.9	-2.7	-3.3	-3.8	-3.3	-3.8
-1.6	-1.9	-2.7	-2.7	-2.8	-2.7	-3.3	-4.8	-4.8	-4.8	-5.4	-4.8	-4.0	-4.1	-4.3	-4.8	-4.4	-4.5	-4.3	-4.9	-5.0	-5.3	-4.8	-4.0	-3.7	-3.5	-3.4	-3.5	-3.8	-3.9	-4.2	-3.5	-4.2	-3.9	-3.2	-2.9
-2.8	-2.1	-1.9	-2.2	-2.2	-2.9	-3.3	-3.9	-4.2	-4.9	-5.5	-4.7	-4.1	-3.8	-3.6	-3.8	-4.1	-3.3	-3.8	-4.6	-4.8	-5.5	-5.8	-5.7	-5.3	-4.7	-4.6	-4.9	-4.7	-4.4	-4.6	-4.7	-4.8	-4.7	-4.4	-3.6
-4.6	-4.3	-4.0	-3.4	-3.7	-3.8	-4.4	-4.6	-4.7	-4.6	-5.4	-6.2	-6.8	-6.1	-5.4	-4.9	-3.9	-3.5	-3.7	-3.9	-3.9	-3.8	-4.3	-4.3	-4.0	-4.2	-3.7	-3.3	-3.7	-4.2	-4.8	-4.8	-5.2	-6.2	-6.3	-5.4
-2.9	-3.3	-3.1	-3.0	-3.0	-3.6	-4.5	-5.2	-4.9	-3.8	-5.1	-5.5	-5.6	-4.8	-4.2	-3.9	-3.5	-3.0	-2.7	-2.8	-2.3	-1.4	-1.2	-.7	-1.3	-1.5	-1.3	-1.3	-1.6	-1.9	-1.5	-.5	-.7	-.8	-1.6	-2.2
-1.7	-1.8	-2.0	-1.8	-2.0	-2.4	-2.9	-3.7	-3.6	-2.6	-3.2	-3.4	-3.6	-3.2	-2.7	-2.3	-2.0	-1.7	-1.3	-1.3	-1.1	-.9	-.8	-.6	-.7	-.9	-.5	.0	-.4	-.4	-.5	-.5	-.7	-.5	-1.3	-1.6

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.6	2.6	3.0	2.8	2.6	2.3	2.3	2.5	2.3	2.4	2.5	2.6	2.4	2.1	1.9	1.9	2.1	2.1	2.2	2.3	2.4	2.5	2.4	2.3	2.3	2.1	2.2	2.2
2.4	2.4	2.5	2.4	2.5	2.6	3.2	3.2	2.7	3.2	3.3	3.3	3.7	3.0	2.4	2.8	2.7	3.1	3.0	2.7	2.4	2.8	3.4	3.4	3.4	3.3	3.1	3.7	3.7	3.3	3.4	2.8	2.6	2.7	2.7	2.4
3.6	4.1	4.7	5.0	4.5	4.3	4.7	4.4	4.2	4.1	4.1	4.0	5.1	4.7	3.5	3.9	4.0	3.7	3.8	4.0	3.3	4.1	4.6	4.7	4.9	4.0	3.5	3.7	3.6	4.1	3.6	3.8	4.1	4.0	3.8	3.5
4.4	5.8	5.2	4.7	4.8	4.7	5.5	6.5	5.8	5.4	5.1	5.2	4.8	5.3	5.0	5.0	5.0	4.1	4.0	4.1	4.3	5.2	5.0	5.1	5.5	4.9	3.9	4.6	5.5	5.4	5.1	5.4	5.4	4.9	5.8	4.7
6.3	6.8	5.8	5.0	4.1	4.2	6.2	6.8	6.0	5.9	6.6	6.4	6.6	5.6	5.9	5.6	4.9	4.8	5.3	5.6	3.9	3.6	4.7	4.4	3.4	4.9	5.9	6.2	7.0	7.2	7.1	6.1	6.0	5.9	5.8	5.3
7.1	6.0	2.0	2.8	3.0	2.8	7.2	7.5	8.2	7.2	8.0	6.4	6.7	5.0	4.8	3.2	2.8	5.1	5.0	2.4	1.9	1.5	2.0	2.9	2.5	5.8	6.1	5.8	4.2	4.9	6.4	4.9	4.5	5.4	7.0	6.4
5.0	3.8	2.6	2.7	1.6	1.8	6.0	8.1	7.3	8.6	7.3	5.7	4.0	5.1	2.5	2.4	4.8	6.5	6.2	2.7	1.2	3.1	2.7	3.2	3.3	5.3	8.7	6.9	6.0	6.1	5.4	5.6	6.1	8.1	5.5	6.3
7.7	8.1	7.3	8.2	8.6	8.2	8.4	10.1	10.7	9.0	7.8	6.9	5.2	6.4	4.7	5.2	10.5	10.1	8.6	9.9	8.4	8.6	6.3	2.6	2.1	8.5	8.5	9.5	9.5	8.3	10.9	11.4	9.0	7.7	6.6	6.9
10.1	9.4	8.5	6.7	5.3	5.0	6.6	7.6	7.6	8.4	11.1	9.9	6.1	5.7	7.0	7.0	7.0	5.5	7.5	9.7	11.0	8.5	3.6	4.9	7.1	7.8	9.5	10.4	9.2	9.6	9.2	8.9	9.2	9.3	8.4	9.3
4.5	2.4	2.5	1.1	.6	.6	.8	.8	.7	1.2	6.9	8.4	7.3	4.0	1.2	.8	1.3	1.3	1.6	5.1	7.9	4.7	1.8	5.3	9.5	9.9	9.9	10.4	6.6	5.2	4.0	7.7	7.6	10.2	8.5	7.7
5.1	4.4	5.4	2.8	1.0	.8	1.1	.7	.5	.5	3.6	6.3	4.1	5.1	4.6	1.7	.9	.8	.7	2.1	2.6	1.6	1.2	1.2	4.5	5.5	4.9	3.1	2.4	1.5	1.5	1.9	2.0	2.9	4.1	4.3
4.2	6.9	9.2	9.3	7.3	6.6	5.1	5.2	4.4	2.4	1.9	3.4	5.7	6.1	5.2	3.4	2.5	3.1	1.8	2.3	2.6	2.2	1.3	2.0	3.4	4.3	3.7	3.5	3.6	4.8	4.1	3.5	3.4	8.4	3.9	3.4
4.0	6.5	7.5	7.9	7.3	6.7	7.6	7.7	8.1	6.8	5.6	6.1	7.6	7.7	6.8	5.3	5.2	5.7	4.1	4.2	5.1	5.9	5.4	4.7	3.6	4.0	4.0	4.3	4.0	4.8	4.9	4.6	6.0	6.4	5.3	5.4
2.6	2.9	3.8	3.6	3.6	3.9	5.1	6.4	6.1	6.0	6.4	7.2	6.3	6.1	6.2	6.3	5.4	5.2	4.9	5.3	5.9	6.5	6.3	5.6	5.3	4.8	4.4	4.2	4.5	4.7	4.9	4.4	5.9	5.9	5.0	4.5
3.5	2.7	2.6	3.0	2.7	3.2	3.6	4.6	5.0	5.6	6.2	6.5	5.5	5.5	4.8	4.6	4.6	3.4	3.7	4.4	4.8	5.6	5.7	5.5	5.3	5.3	5.0	4.6	4.3	4.3	4.8	5.1	5.6	5.2	5.0	4.4
4.5	4.3	4.0	3.8	3.9	3.8	4.0	4.1	4.5	4.9	5.7	6.5	7.2	6.2	5.2	4.8	4.1	3.8	3.5	3.8	4.0	4.1	4.9	5.3	5.0	5.0	4.5	4.0	4.4	4.5	4.9	5.2	5.5	5.7	5.9	5.2
4.5	4.4	3.9	4.2	4.2	4.3	4.9	5.6	5.9	5.2	6.4	6.8	6.7	5.8	5.0	4.8	4.9	4.2	3.6	3.7	3.8	3.3	3.1	2.7	3.2	3.4	2.1	2.0	1.9	2.4	2.3	1.7	2.1	2.5	3.7	4.1
2.7	3.0	3.5	3.9	4.0	4.2	4.1	4.2	4.5	4.0	4.0	4.0	4.9	5.3	5.0	4.5	3.5	2.6	2.1	2.0	1.9	1.8	2.0	2.0	1.7	1.5	1.2	1.0	1.0	1.4	1.8	2.2	2.4	2.9	2.8	2.5

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

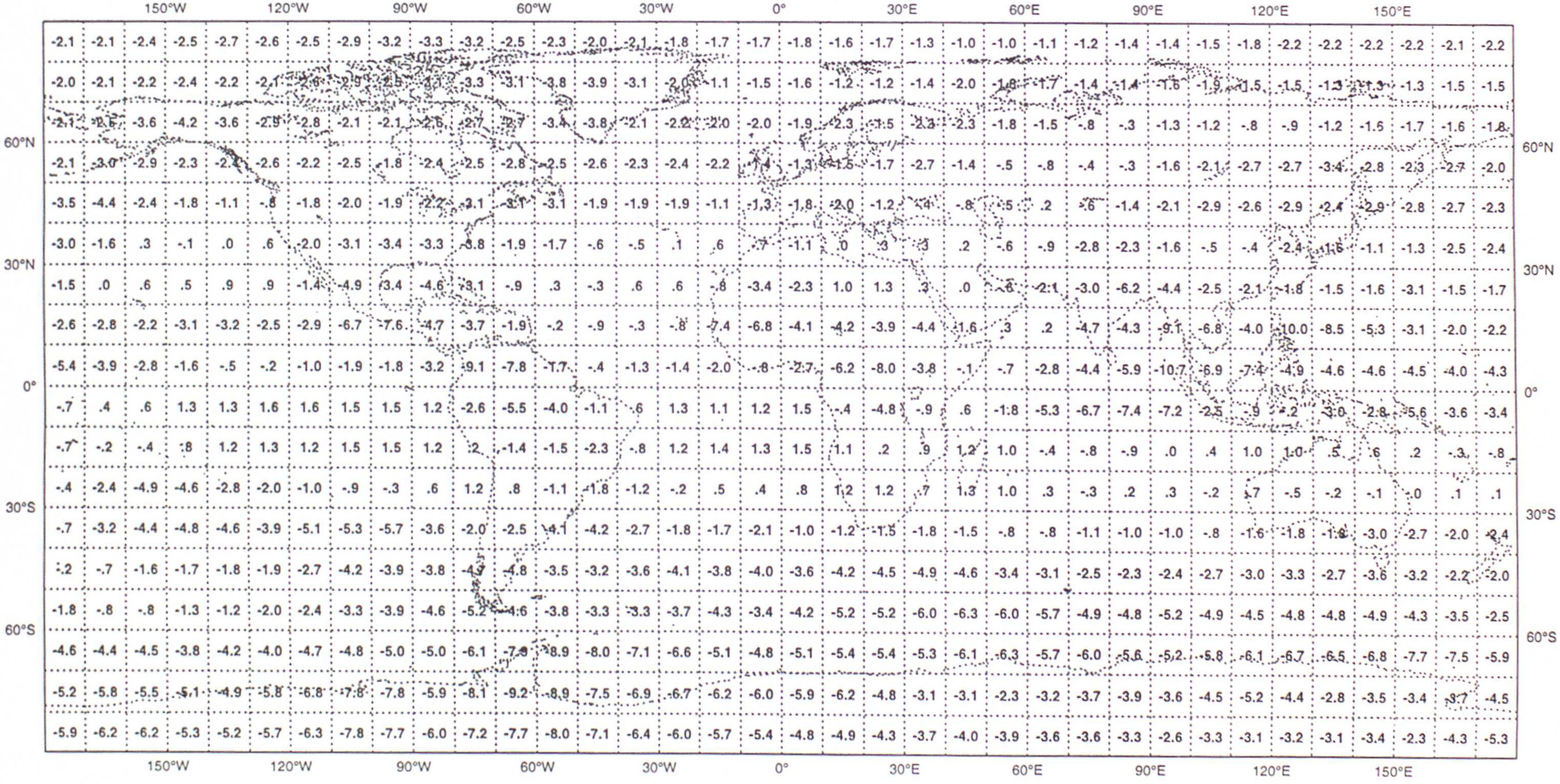
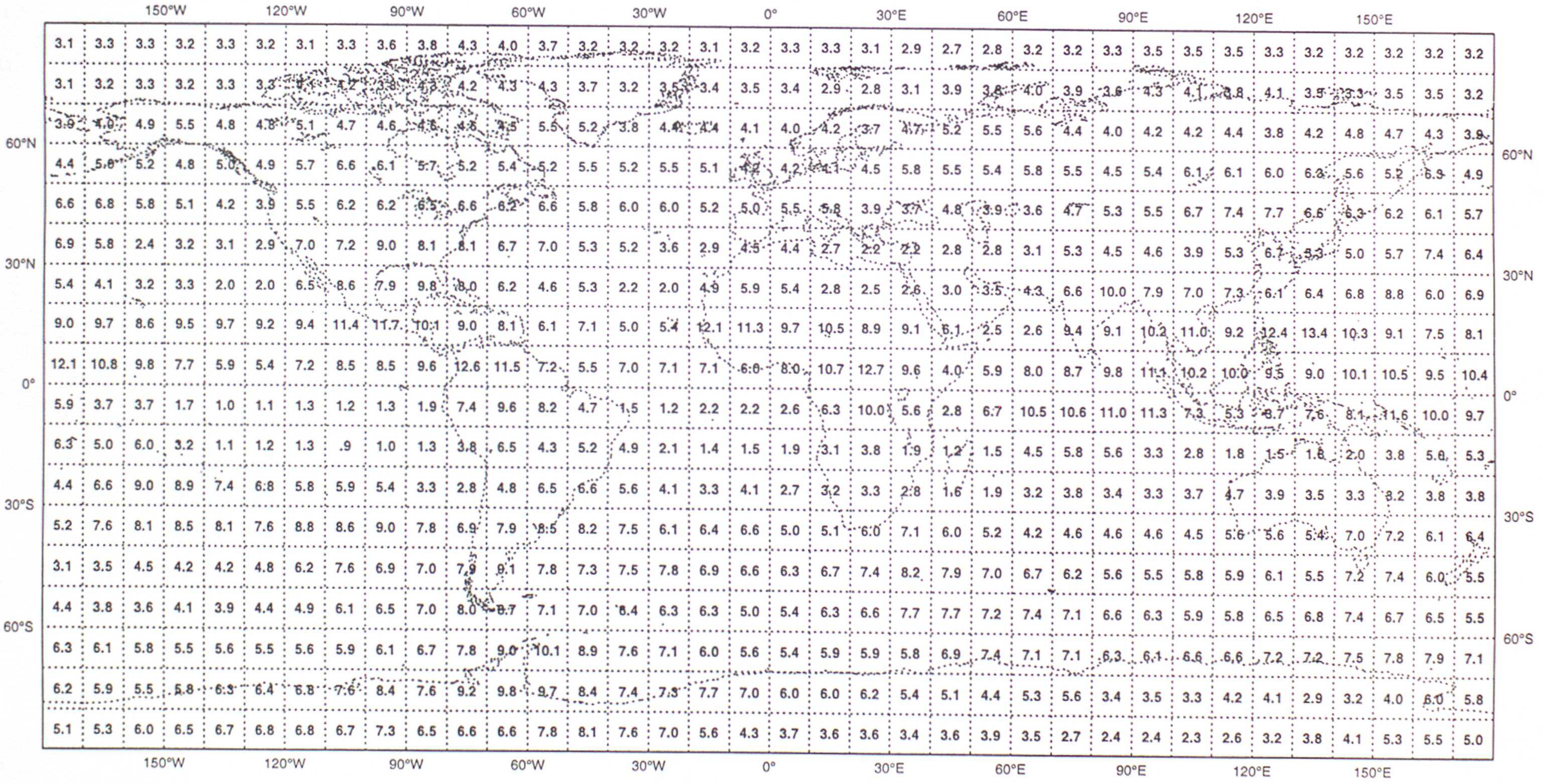
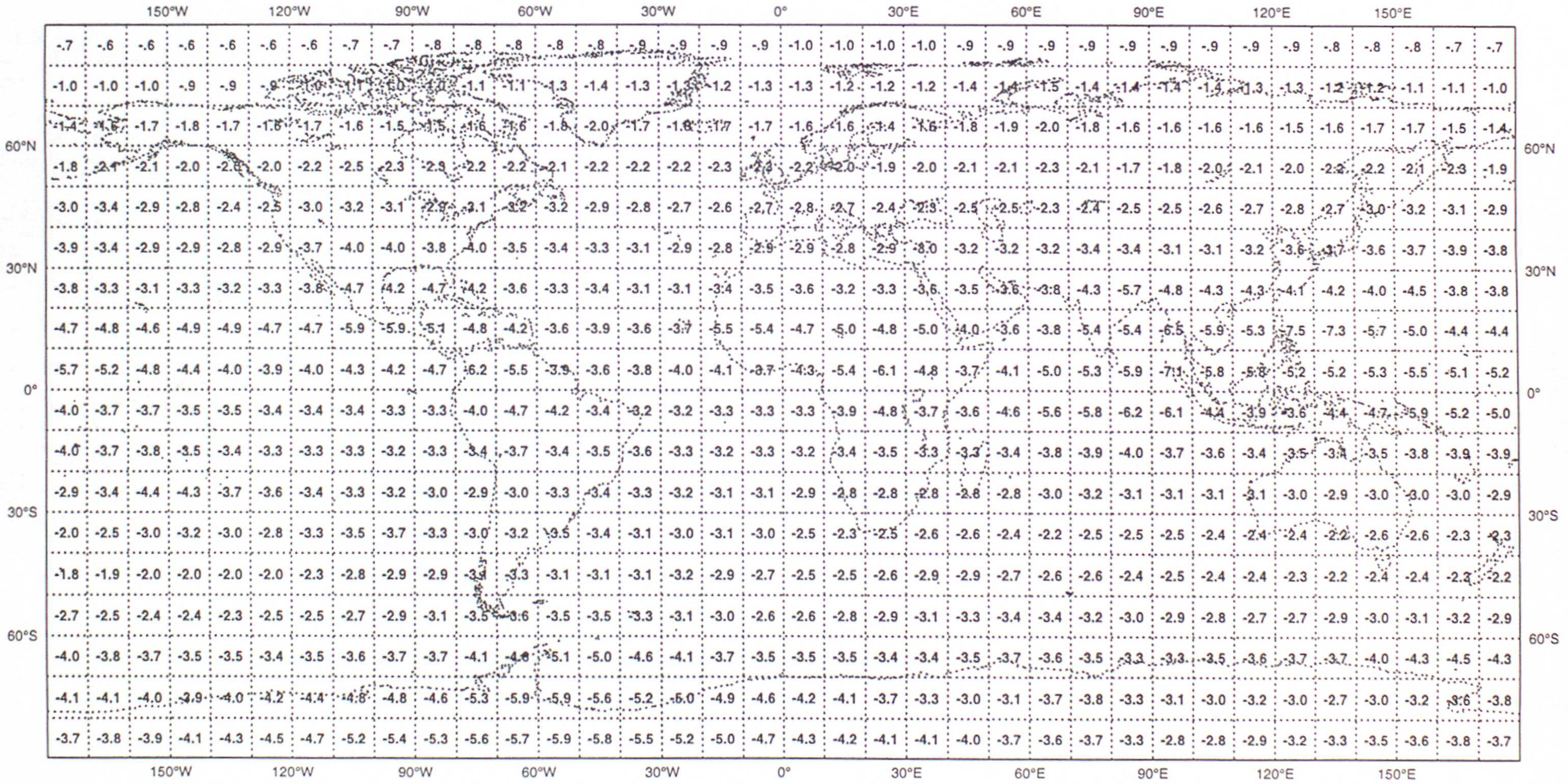

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-2.1 -2.1 -2.4 -2.5 -2.7 -2.6 -2.5 -2.9 -3.2 -3.3 -3.2 -2.5 -2.3 -2.0 -2.1 -1.8 -1.7 -1.7 -1.8 -1.6 -1.7 -1.3 -1.0 -1.0 -1.1 -1.2 -1.4 -1.4 -1.5 -1.8 -2.2 -2.2 -2.2 -2.2 -2.1 -2.2
-2.0 -2.1 -2.2 -2.4 -2.2 -2.1 -2.6 -2.9 -2.5 -3.1 -3.3 -3.1 -3.8 -3.9 -3.1 -2.0 -1.1 -1.5 -1.6 -1.2 -1.2 -1.4 -2.0 -1.8 -1.7 -1.4 -1.4 -1.6 -1.9 -1.5 -1.5 -1.3 -1.3 -1.3 -1.5 -1.5
-2.1 -2.6 -3.6 -4.2 -3.6 -2.9 -2.8 -2.1 -2.1 -2.6 -2.7 -2.7 -3.4 -3.8 -2.1 -2.2 -2.0 -2.0 -1.9 -2.3 -1.5 -2.3 -2.3 -1.8 -1.5 -.8 -.3 -1.3 -1.2 -.8 -.9 -1.2 -1.5 -1.7 -1.6 -1.8
-2.1 -3.0 -2.9 -2.3 -2.4 -2.6 -2.2 -2.5 -1.8 -2.4 -2.5 -2.8 -2.5 -2.6 -2.3 -2.4 -2.2 -1.4 -1.3 -1.5 -1.7 -2.7 -1.4 -.5 -.8 -.4 -.3 -1.6 -2.1 -2.7 -2.7 -3.4 -2.8 -2.3 -2.7 -2.0
-3.5 -4.4 -2.4 -1.8 -1.1 -.8 -1.8 -2.0 -1.9 -2.2 -3.1 -3.1 -3.1 -1.9 -1.9 -1.9 -1.1 -1.3 -1.8 -2.0 -1.2 -.4 -.8 -.5 .2 -.6 -1.4 -2.1 -2.9 -2.6 -2.9 -2.4 -2.9 -2.8 -2.7 -2.3
-3.0 -1.6 .3 -.1 .0 .6 -2.0 -3.1 -3.4 -3.3 -3.8 -1.9 -1.7 -.6 -.5 .1 .6 -.7 -1.1 .0 .3 .3 .2 -.6 -.9 -2.8 -2.3 -1.6 -.5 -.4 -2.4 -1.6 -1.1 -1.3 -2.5 -2.4
-1.5 .0 .6 .5 .9 .9 -1.4 -4.9 -3.4 -4.6 -3.1 -.9 .3 -.3 .6 .6 -.8 -3.4 -2.3 1.0 1.3 .3 .0 -.6 -2.1 -3.0 -6.2 -4.4 -2.5 -2.1 -1.8 -1.5 -1.6 -3.1 -1.5 -1.7
-2.6 -2.8 -2.2 -3.1 -3.2 -2.5 -2.9 -6.7 -7.6 -4.7 -3.7 -1.9 -.2 -.9 -.3 -.8 -7.4 -6.8 -4.1 -4.2 -3.9 -4.4 -1.6 .3 .2 -4.7 -4.3 -9.1 -6.8 -4.0 -10.0 -8.5 -5.3 -3.1 -2.0 -2.2
-5.4 -3.9 -2.8 -1.6 -.5 -.2 -1.0 -1.9 -1.8 -3.2 -9.1 -7.8 -1.7 -.4 -1.3 -1.4 -2.0 -.8 -2.7 -6.2 -8.0 -3.8 -.1 -.7 -2.8 -4.4 -5.9 -10.7 -6.9 -7.4 -4.9 -4.6 -4.6 -4.5 -4.0 -4.3
-.7 .4 .6 1.3 1.3 1.6 1.6 1.5 1.5 1.2 -2.6 -5.5 -4.0 -1.1 .6 1.3 1.1 1.2 1.5 -.4 -4.8 -.9 .6 -1.8 -5.3 -6.7 -7.4 -7.2 -2.5 -.9 -.2 -3.0 -2.8 -5.6 -3.6 -3.4
-.7 -.2 -.4 .8 1.2 1.3 1.2 1.5 1.5 1.2 .2 -1.4 -1.5 -2.3 -.8 1.2 1.4 1.3 1.5 1.1 .2 .9 1.2 1.0 -.4 -.8 -.9 .0 .4 1.0 1.0 .5 .6 .2 -.3 -.8
-.4 -2.4 -4.9 -4.6 -2.8 -2.0 -1.0 -.9 -.3 .6 1.2 .8 -1.1 -1.8 -1.2 -.2 .5 .4 .8 1.2 1.2 .7 1.3 1.0 .3 -.3 .2 .3 -.2 .7 -.5 -.2 -.1 .0 .1 .1
-.7 -3.2 -4.4 -4.8 -4.6 -3.9 -5.1 -5.3 -5.7 -3.6 -2.0 -2.5 -4.1 -4.2 -2.7 -1.8 -1.7 -2.1 -1.0 -1.2 -1.5 -1.8 -1.5 -.8 -.8 -1.1 -1.0 -1.0 -.8 -1.6 -1.8 -1.8 -3.0 -2.7 -2.0 -2.4
-.2 -.7 -1.6 -1.7 -1.8 -1.9 -2.7 -4.2 -3.9 -3.8 -4.7 -4.8 -3.5 -3.2 -3.6 -4.1 -3.8 -4.0 -3.6 -4.2 -4.5 -4.9 -4.6 -3.4 -3.1 -2.5 -2.3 -2.4 -2.7 -3.0 -3.3 -2.7 -3.6 -3.2 -2.2 -2.0
-1.8 -.8 -.8 -1.3 -1.2 -2.0 -2.4 -3.3 -3.9 -4.6 -5.2 -4.6 -3.8 -3.3 -3.3 -3.7 -4.3 -3.4 -4.2 -5.2 -5.2 -6.0 -6.3 -6.0 -5.7 -4.9 -4.8 -5.2 -4.9 -4.5 -4.8 -4.8 -4.9 -4.3 -3.5 -2.5
-4.6 -4.4 -4.5 -3.8 -4.2 -4.0 -4.7 -4.8 -5.0 -5.0 -6.1 -7.9 -8.9 -8.0 -7.1 -6.6 -5.1 -4.8 -5.1 -5.4 -5.4 -5.3 -6.1 -6.3 -5.7 -6.0 -5.6 -5.2 -5.8 -6.1 -6.7 -6.5 -6.8 -7.7 -7.5 -5.9
-5.2 -5.8 -5.5 -5.1 -4.9 -5.8 -6.8 -7.8 -7.8 -5.9 -8.1 -9.2 -8.9 -7.5 -6.9 -6.7 -6.2 -6.0 -5.9 -6.2 -4.8 -3.1 -3.1 -2.3 -3.2 -3.7 -3.9 -3.6 -4.5 -5.2 -4.4 -2.8 -3.5 -3.4 -3.7 -4.5
-5.9 -6.2 -6.2 -5.3 -5.2 -5.7 -6.3 -7.8 -7.7 -6.0 -7.2 -7.7 -8.0 -7.1 -6.4 -6.0 -5.7 -5.4 -4.8 -4.9 -4.3 -3.7 -4.0 -3.9 -3.6 -3.6 -3.3 -2.6 -3.3 -3.1 -3.2 -3.1 -3.4 -2.3 -4.3 -5.3

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



3.1	3.3	3.3	3.2	3.3	3.2	3.1	3.3	3.6	3.8	4.3	4.0	3.7	3.2	3.2	3.2	3.1	3.2	3.3	3.3	3.1	2.9	2.7	2.8	3.2	3.2	3.3	3.5	3.5	3.5	3.3	3.2	3.2	3.2	3.2	3.2
3.1	3.2	3.3	3.2	3.3	3.3	4.1	4.2	3.8	4.3	4.2	4.3	4.3	3.7	3.2	3.5	3.4	3.5	3.4	2.9	2.8	3.1	3.9	3.8	4.0	3.9	3.6	4.3	4.1	3.8	4.1	3.5	3.3	3.5	3.5	3.2
3.9	4.0	4.9	5.5	4.8	4.8	5.1	4.7	4.6	4.6	4.6	4.5	5.5	5.2	3.8	4.4	4.4	4.1	4.0	4.2	3.7	4.7	5.2	5.5	5.6	4.4	4.0	4.2	4.2	4.4	3.8	4.2	4.8	4.7	4.3	3.9
4.4	5.6	5.2	4.8	5.0	4.9	5.7	6.6	6.1	5.7	5.2	5.4	5.2	5.5	5.2	5.5	5.1	4.2	4.2	4.1	4.5	5.8	5.5	5.4	5.8	5.5	4.5	5.4	6.1	6.1	6.0	6.3	5.6	5.2	6.3	4.9
6.6	6.8	5.8	5.1	4.2	3.9	5.5	6.2	6.2	6.5	6.6	6.2	6.6	5.8	6.0	6.0	5.2	5.0	5.5	5.8	3.9	3.7	4.8	3.9	3.6	4.7	5.3	5.5	6.7	7.4	7.7	6.6	6.3	6.2	6.1	5.7
6.9	5.8	2.4	3.2	3.1	2.9	7.0	7.2	9.0	8.1	8.1	6.7	7.0	5.3	5.2	3.6	2.9	4.5	4.4	2.7	2.2	2.2	2.8	2.8	3.1	5.3	4.5	4.6	3.9	5.3	6.7	5.3	5.0	5.7	7.4	6.4
5.4	4.1	3.2	3.3	2.0	2.0	6.5	8.6	7.9	9.8	8.0	6.2	4.6	5.3	2.2	2.0	4.9	5.9	5.4	2.8	2.5	2.6	3.0	3.5	4.3	6.6	10.0	7.9	7.0	7.3	6.1	6.4	6.8	8.8	6.0	6.9
9.0	9.7	8.6	9.5	9.7	9.2	9.4	11.4	11.7	10.1	9.0	8.1	6.1	7.1	5.0	5.4	12.1	11.3	9.7	10.5	8.9	9.1	6.1	2.5	2.6	9.4	9.1	10.2	11.0	9.2	12.4	13.4	10.3	9.1	7.5	8.1
12.1	10.8	9.8	7.7	5.9	5.4	7.2	8.5	8.5	9.6	12.6	11.5	7.2	5.5	7.0	7.1	7.1	6.0	8.0	10.7	12.7	9.6	4.0	5.9	8.0	8.7	9.8	11.1	10.2	10.0	9.5	9.0	10.1	10.5	9.5	10.4
5.9	3.7	3.7	1.7	1.0	1.1	1.3	1.2	1.3	1.9	7.4	9.6	8.2	4.7	1.5	1.2	2.2	2.2	2.6	6.3	10.0	5.6	2.8	6.7	10.5	10.6	11.0	11.3	7.3	5.3	8.7	7.6	8.1	11.6	10.0	9.7
6.3	5.0	6.0	3.2	1.1	1.2	1.3	.9	1.0	1.3	3.8	6.5	4.3	5.2	4.9	2.1	1.4	1.5	1.9	3.1	3.8	1.9	1.2	1.5	4.5	5.8	5.6	3.3	2.8	1.8	1.5	1.8	2.0	3.8	5.0	5.3
4.4	6.6	9.0	8.9	7.4	6.8	5.8	5.9	5.4	3.3	2.8	4.8	6.5	6.6	5.6	4.1	3.3	4.1	2.7	3.2	3.3	2.8	1.6	1.9	3.2	3.8	3.4	3.3	3.7	4.7	3.9	3.5	3.3	8.2	3.8	3.8
5.2	7.6	8.1	8.5	8.1	7.6	8.8	8.6	9.0	7.8	6.9	7.9	8.5	8.2	7.5	6.1	6.4	6.6	5.0	5.1	6.0	7.1	6.0	5.2	4.2	4.6	4.6	4.6	4.5	5.6	5.6	5.4	7.0	7.2	6.1	6.4
3.1	3.5	4.5	4.2	4.2	4.8	6.2	7.6	6.9	7.0	7.9	9.1	7.8	7.3	7.5	7.8	6.9	6.6	6.3	6.7	7.4	8.2	7.9	7.0	6.7	6.2	5.6	5.5	5.8	5.9	6.1	5.5	7.2	7.4	6.0	5.5
4.4	3.8	3.6	4.1	3.9	4.4	4.9	6.1	6.5	7.0	8.0	8.7	7.1	7.0	6.4	6.3	6.3	5.0	5.4	6.3	6.6	7.7	7.7	7.2	7.4	7.1	6.6	6.3	5.9	5.8	6.5	6.8	7.4	6.7	6.5	5.5
6.3	6.1	5.8	5.5	5.6	5.5	5.6	5.9	6.1	6.7	7.8	9.0	10.1	8.9	7.6	7.1	6.0	5.6	5.4	5.9	5.9	5.8	6.9	7.4	7.1	7.1	6.3	6.1	6.6	6.6	7.2	7.2	7.5	7.8	7.9	7.1
6.2	5.9	5.5	5.8	6.3	6.4	6.8	7.6	8.4	7.6	9.2	9.8	9.7	8.4	7.4	7.3	7.7	7.0	6.0	6.0	6.2	5.4	5.1	4.4	5.3	5.6	3.4	3.5	3.3	4.2	4.1	2.9	3.2	4.0	6.0	5.8
5.1	5.3	6.0	6.5	6.7	6.8	6.8	6.7	7.3	6.5	6.6	6.6	7.8	8.1	7.6	7.0	5.6	4.3	3.7	3.6	3.6	3.4	3.6	3.9	3.5	2.7	2.4	2.4	2.3	2.6	3.2	3.8	4.1	5.3	5.5	5.0

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.8	-.8	-.8	-.8	-.8	-.9	-.9	-.9	-.9	-1.0	-1.0	-1.0	-1.0	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.8	-.8	-.8	-.7	-.7
-1.0	-1.0	-1.0	-.9	-.9	-.9	-1.0	-1.1	-1.0	-1.0	-1.1	-1.1	-1.3	-1.4	-1.3	-1.3	-1.2	-1.3	-1.3	-1.2	-1.2	-1.2	-1.4	-1.4	-1.5	-1.4	-1.4	-1.4	-1.4	-1.3	-1.3	-1.2	-1.2	-1.1	-1.1	-1.0
-1.4	-1.6	-1.7	-1.8	-1.7	-1.6	-1.7	-1.6	-1.5	-1.5	-1.6	-1.6	-1.8	-2.0	-1.7	-1.8	-1.7	-1.7	-1.6	-1.6	-1.4	-1.6	-1.8	-1.9	-2.0	-1.8	-1.6	-1.6	-1.6	-1.6	-1.5	-1.6	-1.7	-1.7	-1.5	-1.4
-1.8	-2.1	-2.1	-2.0	-2.8	-2.0	-2.2	-2.5	-2.3	-2.9	-2.2	-2.2	-2.1	-2.2	-2.2	-2.2	-2.3	-2.3	-2.2	-2.0	-1.9	-2.0	-2.1	-2.1	-2.3	-2.1	-1.7	-1.8	-2.0	-2.1	-2.0	-2.2	-2.2	-2.1	-2.3	-1.9
-3.0	-3.4	-2.9	-2.8	-2.4	-2.5	-3.0	-3.2	-3.1	-2.9	-3.1	-3.2	-3.2	-2.9	-2.8	-2.7	-2.6	-2.7	-2.8	-2.7	-2.4	-2.3	-2.5	-2.5	-2.3	-2.4	-2.5	-2.5	-2.6	-2.7	-2.8	-2.7	-3.0	-3.2	-3.1	-2.9
-3.9	-3.4	-2.9	-2.9	-2.8	-2.9	-3.7	-4.0	-4.0	-3.8	-4.0	-3.5	-3.4	-3.3	-3.1	-2.9	-2.8	-2.9	-2.9	-2.8	-2.9	-3.0	-3.2	-3.2	-3.2	-3.4	-3.4	-3.1	-3.1	-3.2	-3.6	-3.7	-3.6	-3.7	-3.9	-3.8
-3.8	-3.3	-3.1	-3.3	-3.2	-3.3	-3.8	-4.7	-4.2	-4.7	-4.2	-3.6	-3.3	-3.4	-3.1	-3.1	-3.4	-3.5	-3.6	-3.2	-3.3	-3.6	-3.5	-3.6	-3.8	-4.3	-5.7	-4.8	-4.3	-4.3	-4.1	-4.2	-4.0	-4.5	-3.8	-3.8
-4.7	-4.8	-4.6	-4.9	-4.9	-4.7	-4.7	-5.9	-5.9	-5.1	-4.8	-4.2	-3.6	-3.9	-3.6	-3.7	-5.5	-5.4	-4.7	-5.0	-4.8	-5.0	-4.0	-3.6	-3.8	-5.4	-5.4	-6.5	-5.9	-5.3	-7.5	-7.3	-5.7	-5.0	-4.4	-4.4
-5.7	-5.2	-4.8	-4.4	-4.0	-3.9	-4.0	-4.3	-4.2	-4.7	-6.2	-5.5	-3.9	-3.6	-3.8	-4.0	-4.1	-3.7	-4.3	-5.4	-6.1	-4.8	-3.7	-4.1	-5.0	-5.3	-5.9	-7.1	-5.8	-5.8	-5.2	-5.2	-5.3	-5.5	-5.1	-5.2
-4.0	-3.7	-3.7	-3.5	-3.5	-3.4	-3.4	-3.4	-3.3	-3.3	-4.0	-4.7	-4.2	-3.4	-3.2	-3.2	-3.3	-3.3	-3.3	-3.9	-4.8	-3.7	-3.6	-4.6	-5.6	-5.8	-6.2	-6.1	-4.4	-3.9	-3.6	-4.4	-4.7	-5.9	-5.2	-5.0
-4.0	-3.7	-3.8	-3.5	-3.4	-3.3	-3.3	-3.3	-3.2	-3.3	-3.4	-3.7	-3.4	-3.5	-3.6	-3.3	-3.2	-3.3	-3.2	-3.4	-3.5	-3.3	-3.3	-3.4	-3.8	-3.9	-4.0	-3.7	-3.6	-3.4	-3.5	-3.4	-3.5	-3.8	-3.9	-3.9
-2.9	-3.4	-4.4	-4.3	-3.7	-3.6	-3.4	-3.3	-3.2	-3.0	-2.9	-3.0	-3.3	-3.4	-3.3	-3.2	-3.1	-3.1	-2.9	-2.8	-2.8	-2.8	-2.8	-2.8	-3.0	-3.2	-3.1	-3.1	-3.1	-3.1	-3.0	-2.9	-3.0	-3.0	-3.0	-2.9
-2.0	-2.5	-3.0	-3.2	-3.0	-2.8	-3.3	-3.5	-3.7	-3.3	-3.0	-3.2	-3.5	-3.4	-3.1	-3.0	-3.1	-3.0	-2.5	-2.3	-2.5	-2.6	-2.6	-2.4	-2.2	-2.5	-2.5	-2.5	-2.4	-2.4	-2.4	-2.2	-2.6	-2.6	-2.3	-2.3
-1.8	-1.9	-2.0	-2.0	-2.0	-2.0	-2.3	-2.8	-2.9	-2.9	-3.4	-3.3	-3.1	-3.1	-3.1	-3.2	-2.9	-2.7	-2.5	-2.5	-2.6	-2.9	-2.9	-2.7	-2.6	-2.6	-2.4	-2.5	-2.4	-2.4	-2.3	-2.2	-2.4	-2.4	-2.3	-2.2
-2.7	-2.5	-2.4	-2.4	-2.3	-2.5	-2.5	-2.7	-2.9	-3.1	-3.5	-3.6	-3.5	-3.5	-3.3	-3.1	-3.0	-2.6	-2.6	-2.8	-2.9	-3.1	-3.3	-3.4	-3.4	-3.2	-3.0	-2.9	-2.8	-2.7	-2.7	-2.9	-3.0	-3.1	-3.2	-2.9
-4.0	-3.8	-3.7	-3.5	-3.5	-3.4	-3.5	-3.6	-3.7	-3.7	-4.1	-4.8	-5.1	-5.0	-4.6	-4.1	-3.7	-3.5	-3.5	-3.5	-3.4	-3.4	-3.5	-3.7	-3.6	-3.5	-3.3	-3.3	-3.5	-3.6	-3.7	-3.7	-4.0	-4.3	-4.5	-4.3
-4.1	-4.1	-4.0	-3.9	-4.0	-4.2	-4.4	-4.8	-4.8	-4.6	-5.3	-5.9	-5.9	-5.6	-5.2	-5.0	-4.9	-4.6	-4.2	-4.1	-3.7	-3.3	-3.0	-3.1	-3.7	-3.8	-3.3	-3.1	-3.0	-3.2	-3.0	-2.7	-3.0	-3.2	-3.6	-3.8
-3.7	-3.8	-3.9	-4.1	-4.3	-4.5	-4.7	-5.2	-5.4	-5.3	-5.6	-5.7	-5.9	-5.8	-5.5	-5.2	-5.0	-4.7	-4.3	-4.2	-4.1	-4.1	-4.0	-3.7	-3.6	-3.7	-3.3	-2.8	-2.8	-2.9	-3.2	-3.3	-3.5	-3.6	-3.8	-3.7

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

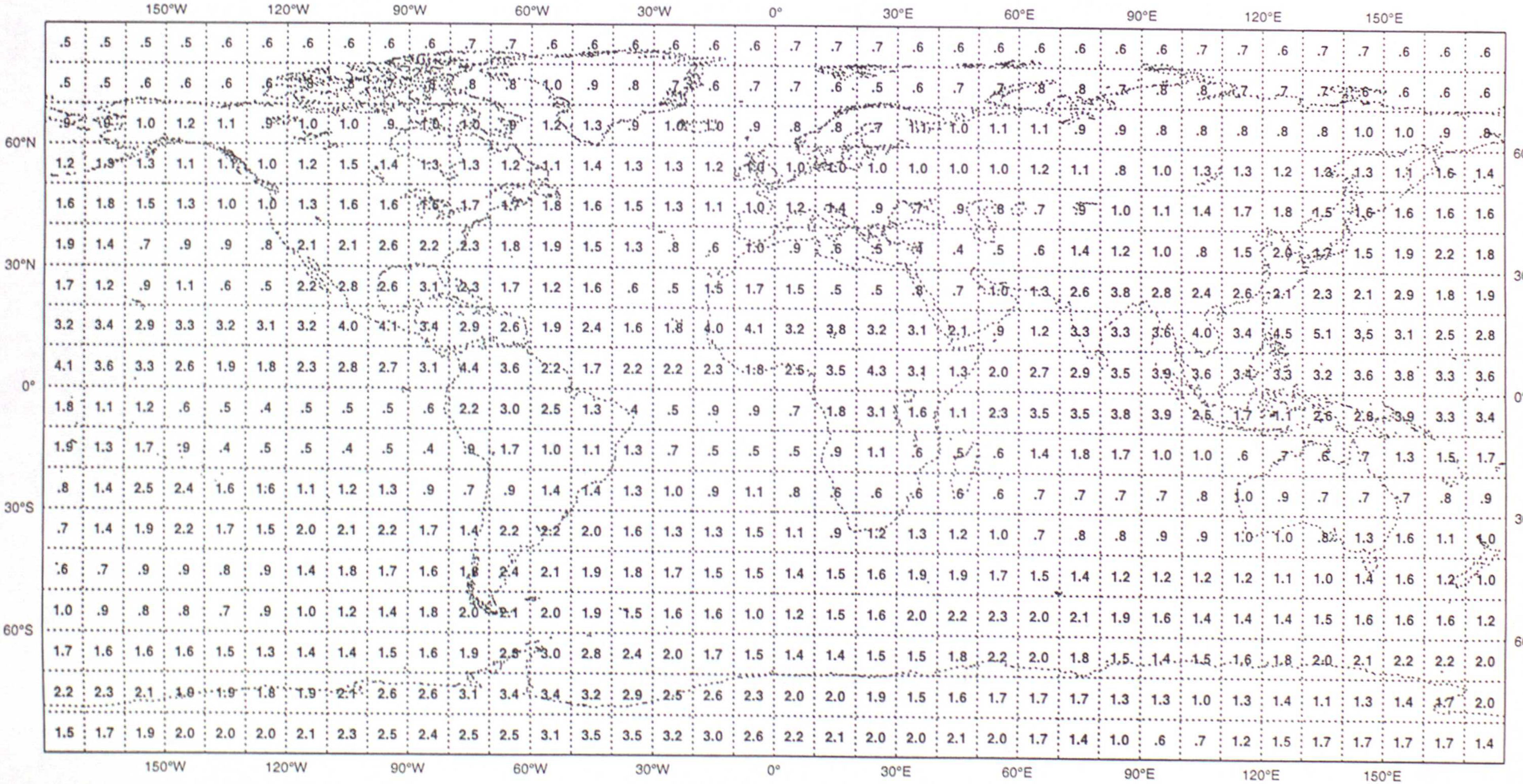

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .6 .7 .7 .7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .7 .7 .6 .6 .6
.5 .5 .6 .6 .6 .6 .8 .8 .7 .8 .8 .8 1.0 .9 .8 .7 .6 .7 .7 .6 .5 .6 .7 .7 .8 .8 .7 .8 .8 .7 .7 .7 .6 .6 .6 .6
.9 .9 1.0 1.2 1.1 .9 1.0 1.0 .9 1.0 1.0 .9 1.2 1.3 .9 1.0 1.0 .9 .8 .8 .7 1.1 1.0 1.1 1.1 .9 .9 .8 .8 .8 .8 .8 1.0 1.0 .9 .8
1.2 1.9 1.3 1.1 1.1 1.0 1.2 1.5 1.4 1.3 1.3 1.2 1.1 1.4 1.3 1.3 1.2 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.2 1.1 .8 1.0 1.3 1.3 1.2 1.3 1.3 1.1 1.6 1.4
1.6 1.8 1.5 1.3 1.0 1.0 1.3 1.6 1.6 1.6 1.7 1.7 1.8 1.6 1.5 1.3 1.1 1.0 1.2 1.4 .9 .7 .9 .8 .7 .9 1.0 1.1 1.4 1.7 1.8 1.5 1.6 1.6 1.6 1.6
1.9 1.4 .7 .9 .9 .8 2.1 2.1 2.6 2.2 2.3 1.8 1.9 1.5 1.3 .8 .6 1.0 .9 .6 .5 .4 .4 .5 .6 1.4 1.2 1.0 .8 1.5 2.0 1.7 1.5 1.9 2.2 1.8
1.7 1.2 .9 1.1 .6 .5 2.2 2.8 2.6 3.1 2.3 1.7 1.2 1.6 .6 .5 1.5 1.7 1.5 .5 .5 .8 .7 1.0 1.3 2.6 3.8 2.8 2.4 2.6 2.1 2.3 2.1 2.9 1.8 1.9
3.2 3.4 2.9 3.3 3.2 3.1 3.2 4.0 4.1 3.4 2.9 2.6 1.9 2.4 1.6 1.8 4.0 4.1 3.2 3.8 3.2 3.1 2.1 .9 1.2 3.3 3.3 3.6 4.0 3.4 4.5 5.1 3.5 3.1 2.5 2.8
4.1 3.6 3.3 2.6 1.9 1.8 2.3 2.8 2.7 3.1 4.4 3.6 2.2 1.7 2.2 2.2 2.3 1.8 2.5 3.5 4.3 3.1 1.3 2.0 2.7 2.9 3.5 3.9 3.6 3.4 3.3 3.2 3.6 3.8 3.3 3.6
1.8 1.1 1.2 .6 .5 .4 .5 .5 .5 .6 2.2 3.0 2.5 1.3 .4 .5 .9 .9 .7 1.8 3.1 1.6 1.1 2.3 3.5 3.5 3.8 3.9 2.5 1.7 1.1 2.6 2.8 3.9 3.3 3.4
1.9 1.3 1.7 .9 .4 .5 .5 .4 .5 .4 .9 1.7 1.0 1.1 1.3 .7 .5 .5 .5 .9 1.1 .6 .5 .6 1.4 1.8 1.7 1.0 1.0 .6 .7 .6 .7 1.3 1.5 1.7
.8 1.4 2.5 2.4 1.6 1.6 1.1 1.2 1.3 .9 .7 .9 1.4 1.4 1.3 1.0 .9 1.1 .8 .6 .6 .6 .6 .6 .7 .7 .7 .7 .8 1.0 .9 .7 .7 .7 .8 .9
.7 1.4 1.9 2.2 1.7 1.5 2.0 2.1 2.2 1.7 1.4 2.2 2.2 2.0 1.6 1.3 1.3 1.5 1.1 .9 1.2 1.3 1.2 1.0 .7 .8 .8 .9 .9 1.0 1.0 .8 1.3 1.6 1.1 1.0
.6 .7 .9 .9 .8 .9 1.4 1.8 1.7 1.6 1.8 2.4 2.1 1.9 1.8 1.7 1.5 1.5 1.4 1.5 1.6 1.9 1.9 1.7 1.5 1.4 1.2 1.2 1.2 1.2 1.1 1.0 1.4 1.6 1.2 1.0
1.0 .9 .8 .8 .7 .9 1.0 1.2 1.4 1.8 2.0 2.1 2.0 1.9 1.5 1.6 1.6 1.0 1.2 1.5 1.6 2.0 2.2 2.3 2.0 2.1 1.9 1.6 1.4 1.4 1.4 1.5 1.6 1.6 1.6 1.2
1.7 1.6 1.6 1.6 1.5 1.3 1.4 1.4 1.5 1.6 1.9 2.5 3.0 2.8 2.4 2.0 1.7 1.5 1.4 1.4 1.5 1.5 1.8 2.2 2.0 1.8 1.5 1.4 1.5 1.6 1.8 2.0 2.1 2.2 2.2 2.0
2.2 2.3 2.1 1.8 1.9 1.8 1.9 2.1 2.6 2.6 3.1 3.4 3.4 3.2 2.9 2.5 2.6 2.3 2.0 2.0 1.9 1.5 1.6 1.7 1.7 1.7 1.3 1.3 1.0 1.3 1.4 1.1 1.3 1.4 1.7 2.0
1.5 1.7 1.9 2.0 2.0 2.0 2.1 2.3 2.5 2.4 2.5 2.5 3.1 3.5 3.5 3.2 3.0 2.6 2.2 2.1 2.0 2.0 2.1 2.0 1.7 1.4 1.0 .6 .7 1.2 1.5 1.7 1.7 1.7 1.7 1.4

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

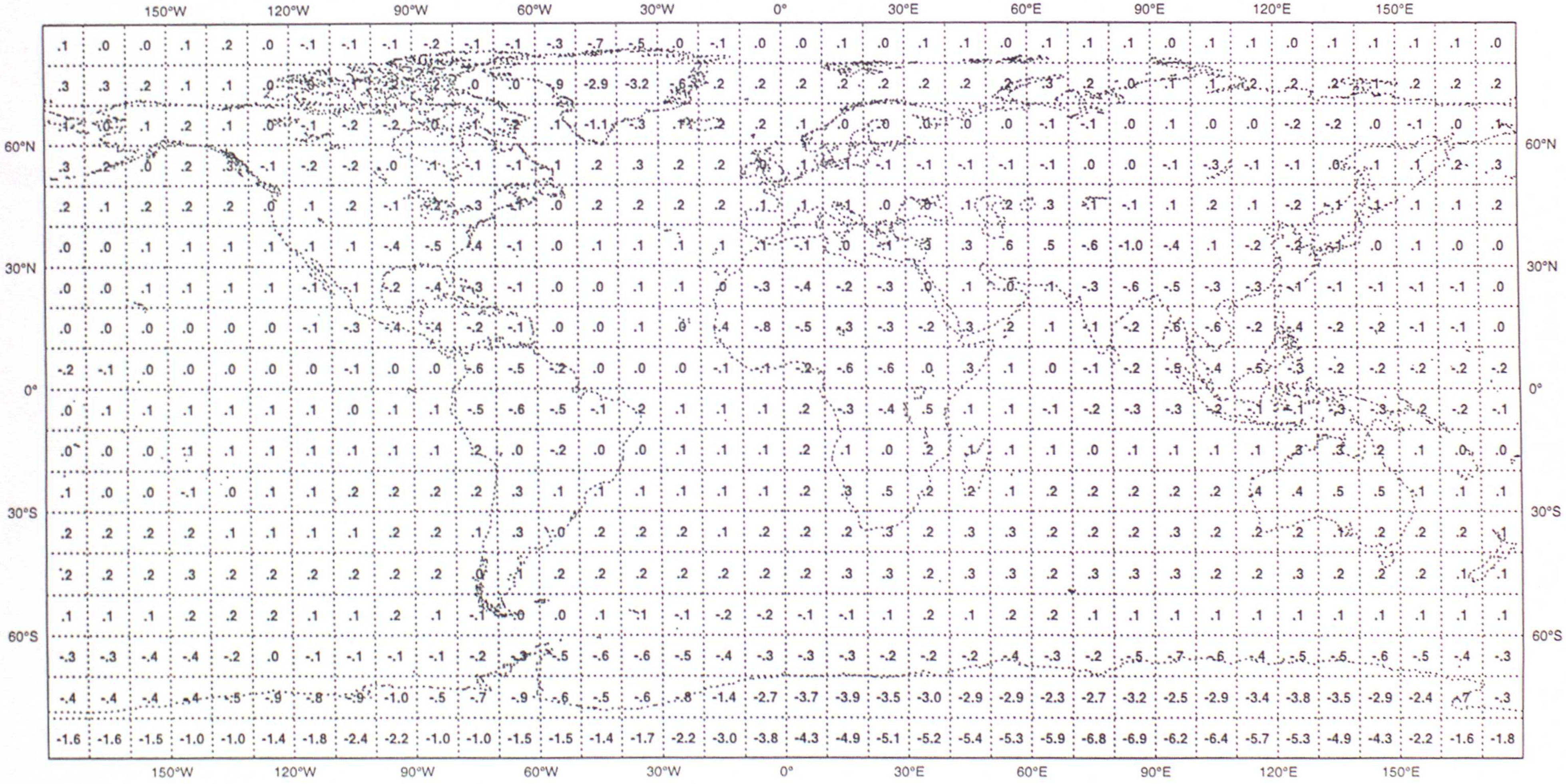

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

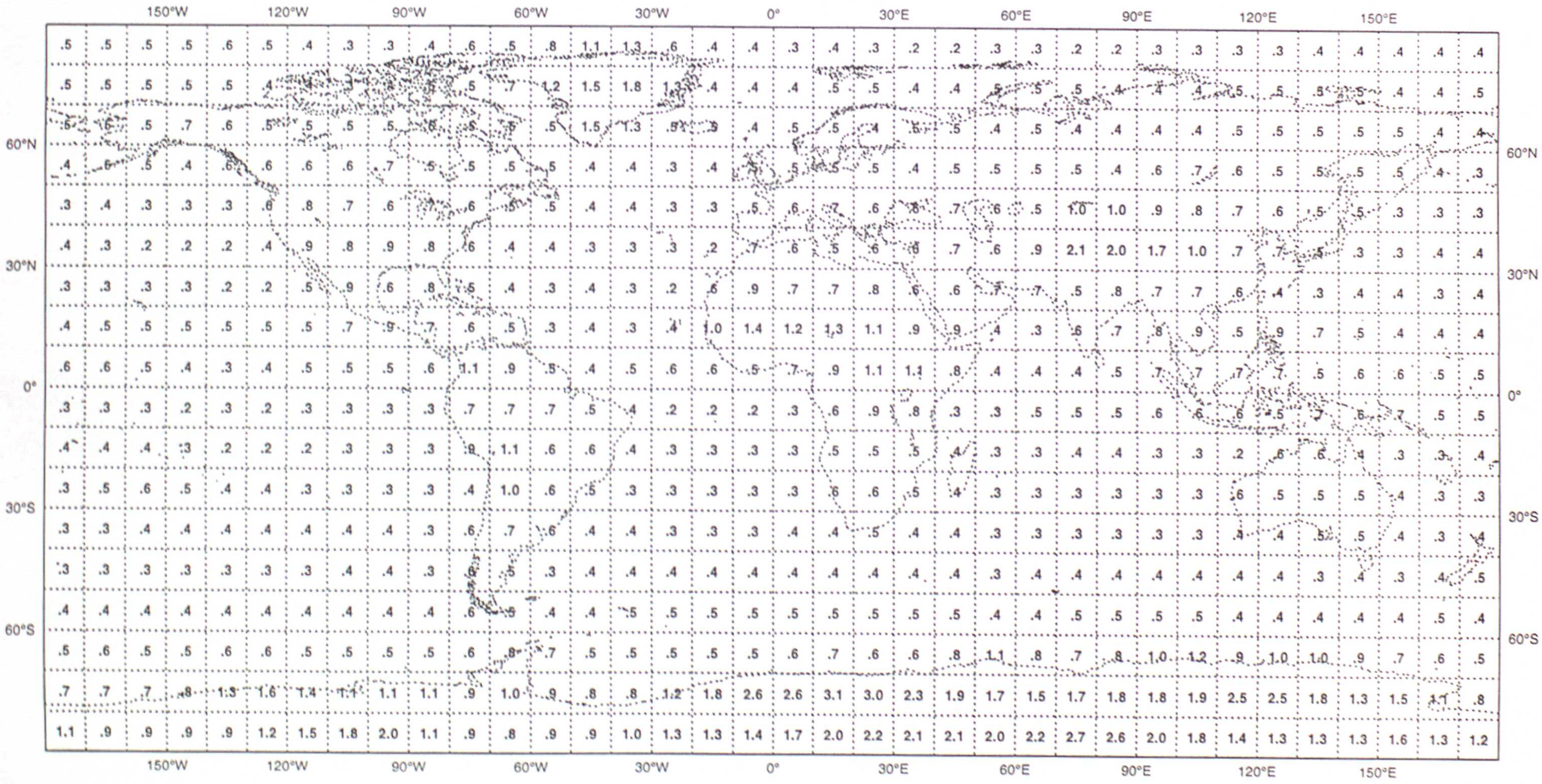

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .6 .5 .4 .3 .3 .4 .6 .5 .8 1.1 1.3 .6 .4 .4 .3 .4 .3 .2 .2 .3 .3 .2 .2 .3 .3 .3 .3 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .4 .4 .3 [illegible] .5 .5 .7 1.2 1.5 1.8 1.3 .4 .4 .4 .5 .5 .4 .4 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .4 .4 .5
.5 .6 .5 .7 .6 .5 .5 .5 .5 .6 .5 .5 .5 1.5 1.3 .5 .5 .4 .5 .5 .4 .5 .5 .4 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4
.4 .6 .5 .4 .6 .6 .6 .6 .7 .5 .5 .5 .5 .4 .4 .3 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .6 .7 .6 .5 .5 .5 .5 .4 .3
.3 .4 .3 .3 .3 .6 .8 .7 .6 .7 .6 .5 .5 .4 .4 .3 .3 .5 .6 .7 .6 .8 .7 .6 .5 1.0 1.0 .9 .8 .7 .6 .5 .5 .3 .3 .3
.4 .3 .2 .2 .2 .4 .9 .8 .9 .8 .6 .4 .4 .3 .3 .3 .2 .7 .6 .5 .6 .6 .7 .6 .9 2.1 2.0 1.7 1.0 .7 .7 .5 .3 .3 .4 .4
.3 .3 .3 .3 .2 .2 .5 .9 .6 .8 .5 .4 .3 .4 .3 .2 .6 .9 .7 .7 .8 .6 .6 .7 .7 .5 .8 .7 .7 .6 .4 .3 .4 .4 .3 .4
.4 .5 .5 .5 .5 .5 .5 .7 .9 .7 .6 .5 .3 .4 .3 .4 1.0 1.4 1.2 1.3 1.1 .9 .9 .4 .3 .6 .7 .8 .9 .5 .9 .7 .5 .4 .4 .4
.6 .6 .5 .4 .3 .4 .5 .5 .5 .6 1.1 .9 .5 .4 .5 .6 .6 .5 .7 .9 1.1 1.1 .8 .4 .4 .4 .5 .7 .7 .7 .7 .5 .6 .6 .5 .5
.3 .3 .3 .2 .3 .2 .3 .3 .3 .3 .7 .7 .7 .5 .4 .2 .2 .2 .3 .6 .9 .8 .3 .3 .5 .5 .5 .6 .6 .6 .5 .7 .6 .7 .5 .5
.4 .4 .4 .3 .2 .2 .2 .3 .3 .3 .9 1.1 .6 .6 .4 .3 .3 .3 .3 .5 .5 .5 .4 .3 .3 .4 .4 .3 .3 .2 .6 .6 .4 .3 .3 .4
.3 .5 .6 .5 .4 .4 .3 .3 .3 .3 .4 1.0 .6 .5 .3 .3 .3 .3 .3 .6 .6 .5 .4 .3 .3 .3 .3 .3 .3 .6 .5 .5 .5 .4 .3 .3
.3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .6 .7 .6 .4 .4 .3 .3 .3 .4 .4 .5 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .5 .5 .4 .3 .4
.3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .6 .5 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .4 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .5 .4
.5 .6 .5 .5 .6 .6 .5 .5 .5 .5 .6 .8 .7 .5 .5 .5 .5 .5 .6 .7 .6 .6 .8 1.1 .8 .7 .8 1.0 1.2 .9 1.0 1.0 .9 .7 .6 .5
.7 .7 .7 .8 1.3 1.6 1.4 1.1 1.1 1.1 .9 1.0 .9 .8 .8 1.2 1.8 2.6 2.6 3.1 3.0 2.3 1.9 1.7 1.5 1.7 1.8 1.8 1.9 2.5 2.5 1.8 1.3 1.5 1.1 .8
1.1 .9 .9 .9 .9 1.2 1.5 1.8 2.0 1.1 .9 .8 .9 .9 1.0 1.3 1.3 1.4 1.7 2.0 2.2 2.1 2.1 2.0 2.2 2.7 2.6 2.0 1.8 1.4 1.3 1.3 1.3 1.6 1.3 1.2

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

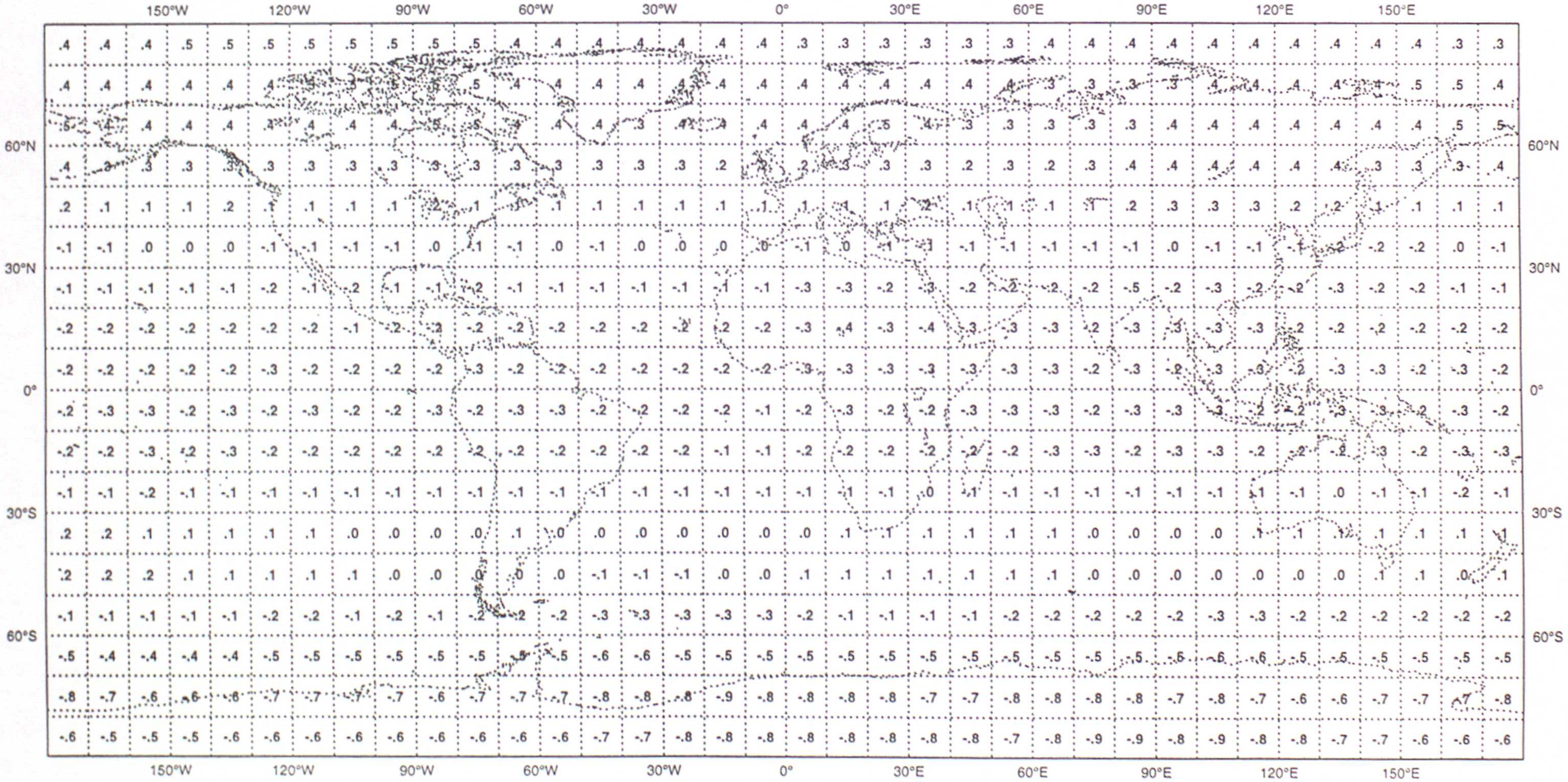

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

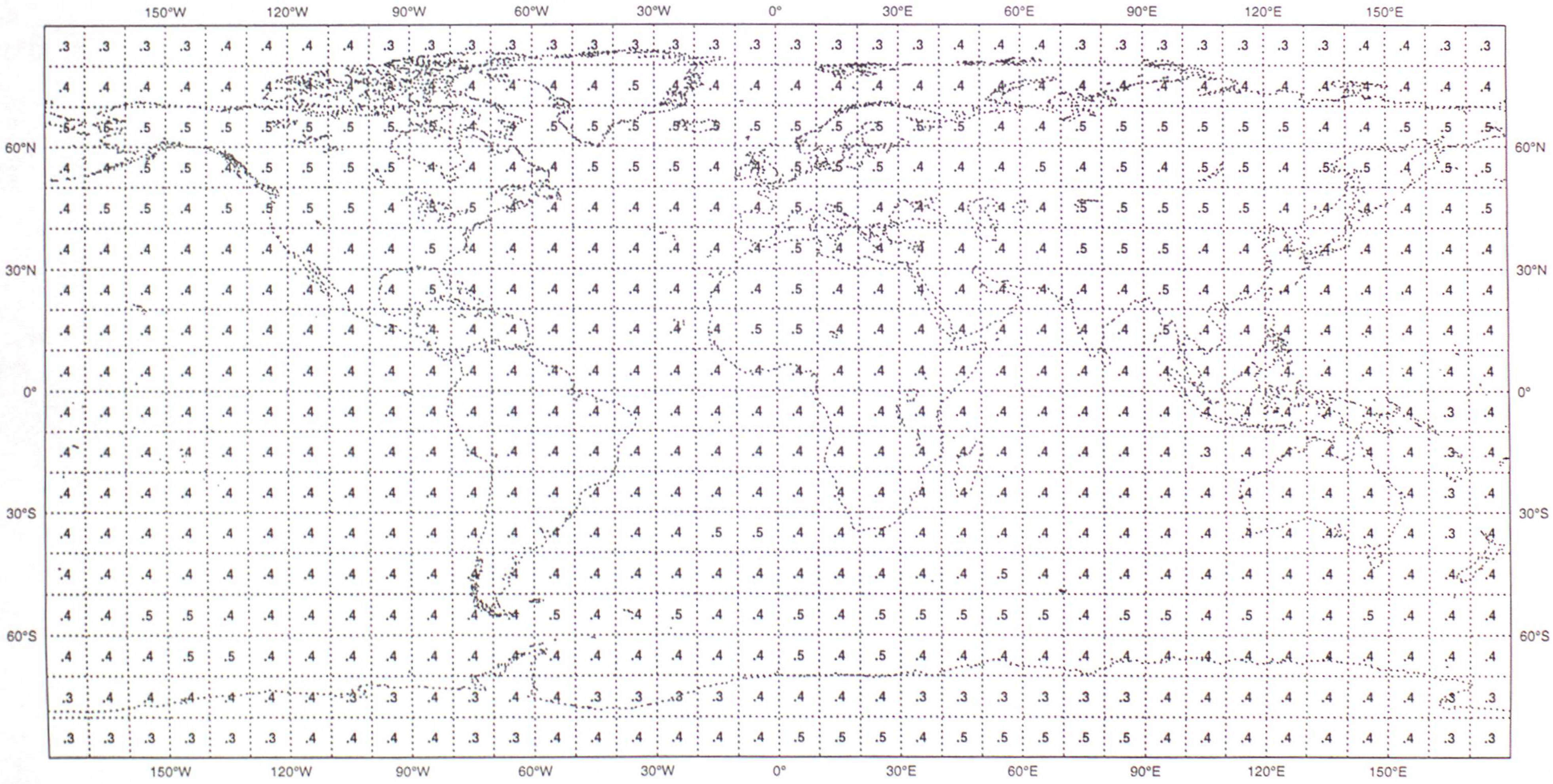

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

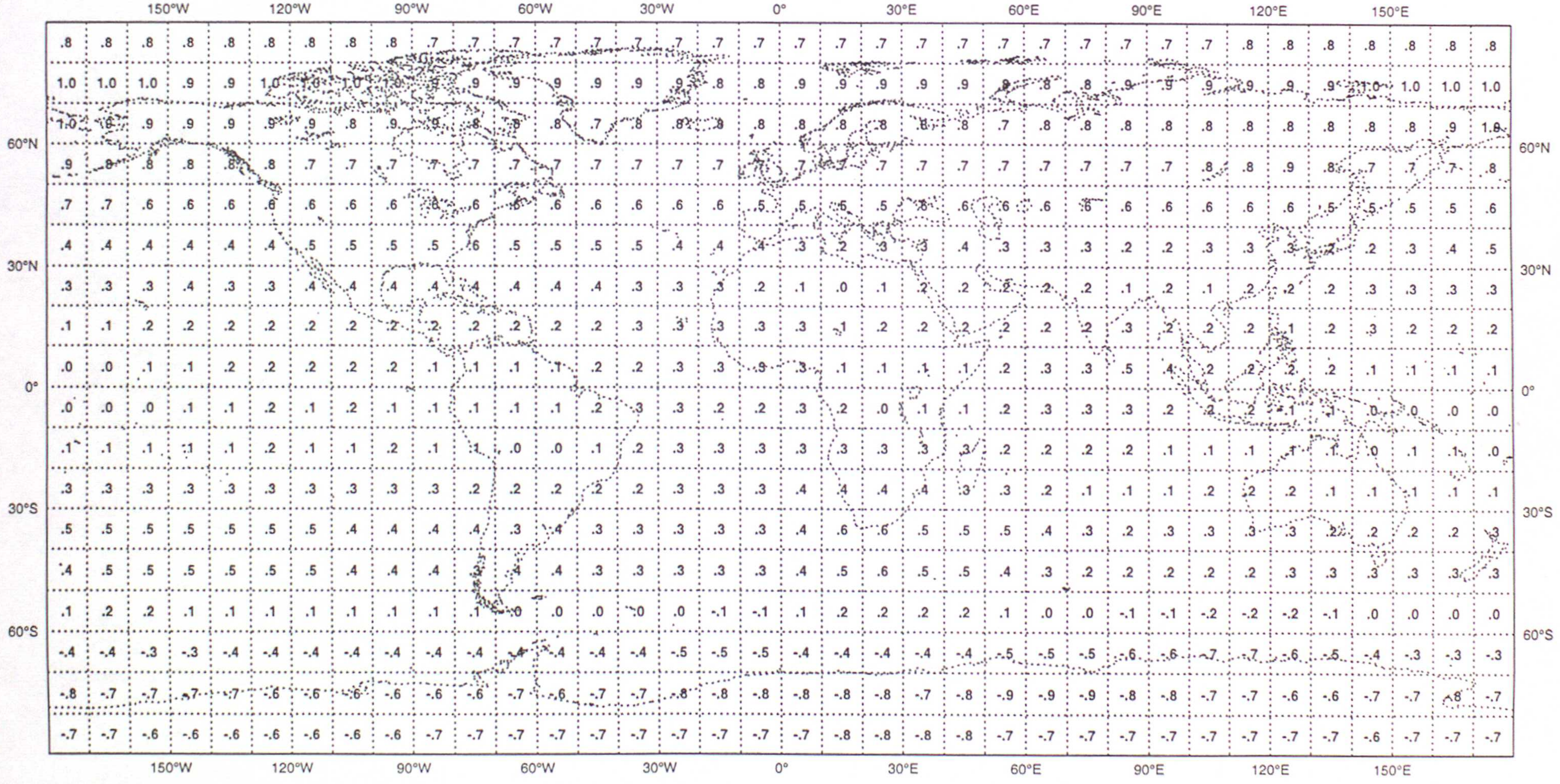
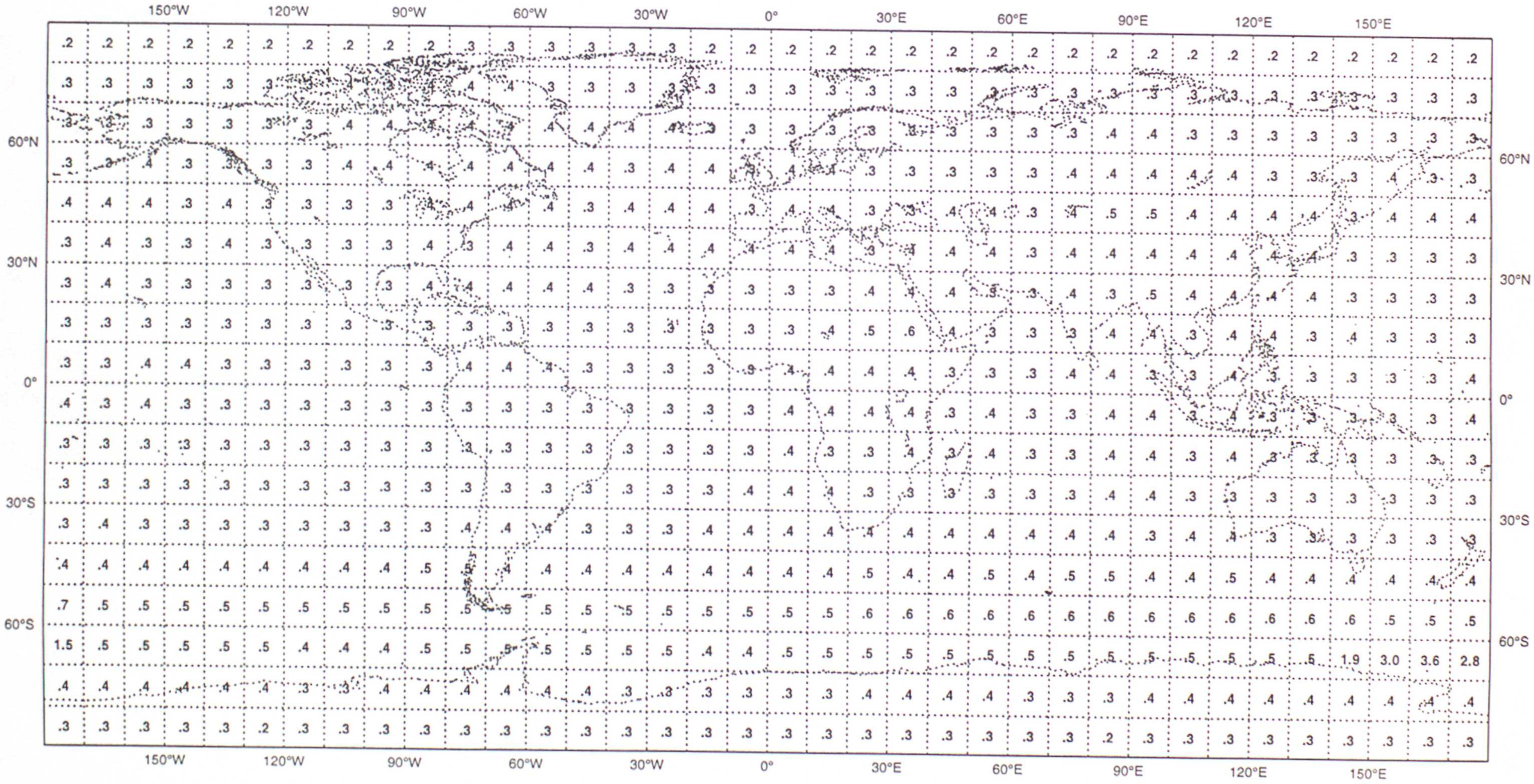
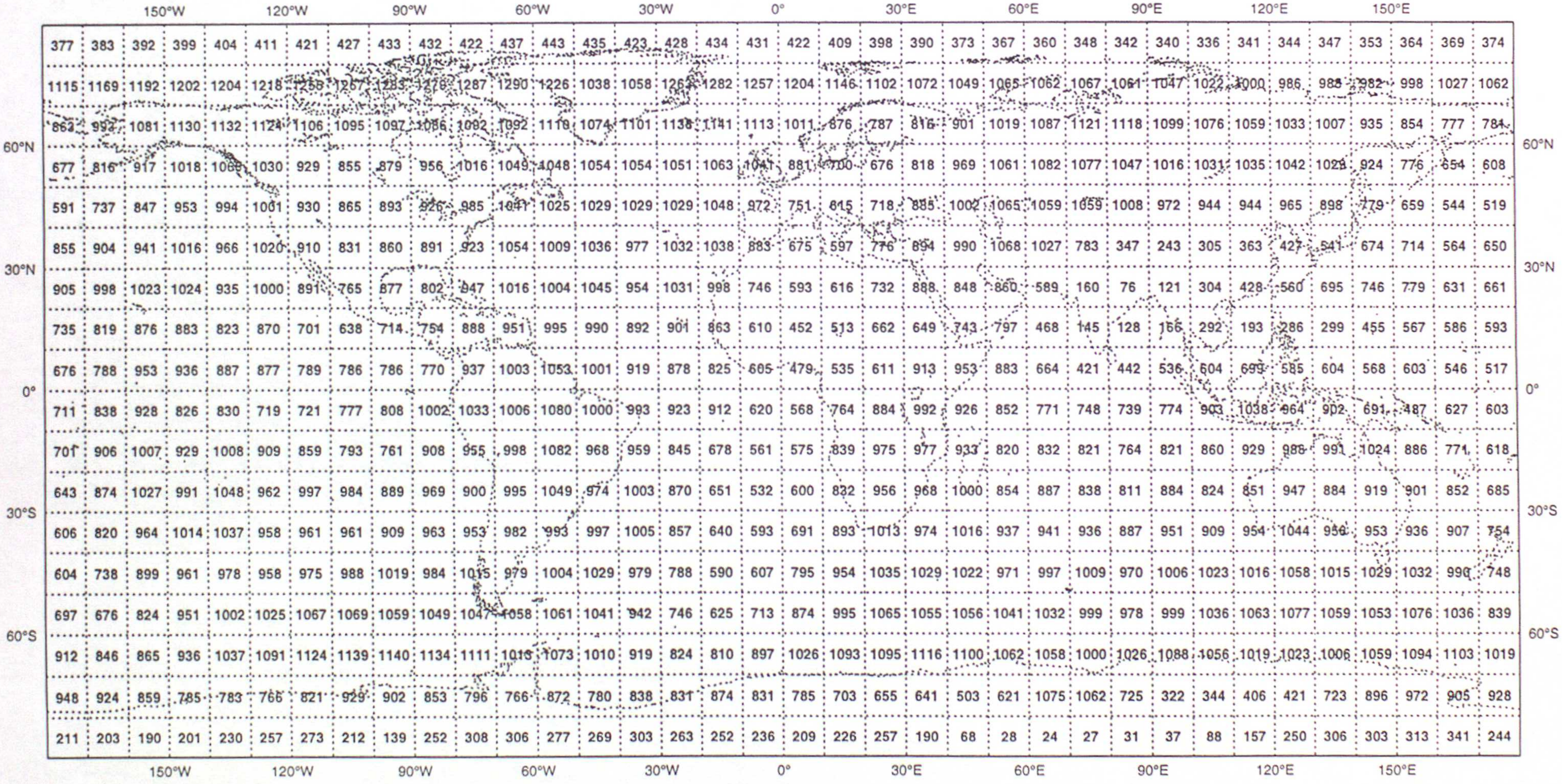

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.8 .8 .8 .8 .8 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .8
1.0 1.0 1.0 .9 .9 1.0 1.0 1.0 1.0 .9 .9 .9 .9 .9 .9 .9 .8 .8 .9 .9 .9 .9 .9 .9 .8 .8 .9 .9 .9 .9 .9 .9 1.0 1.0 1.0 1.0
1.0 .8 .9 .9 .9 .9 .9 .8 .9 .9 .8 .8 .8 .7 .8 .8 .8 .8 .8 .8 .8 .8 .8 .7 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .9 1.0
.9 .8 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .9 .8 .7 .7 .7 .8
.7 .7 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .6
.4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .6 .5 .5 .5 .5 .4 .4 .4 .3 .2 .3 .3 .4 .3 .3 .3 .2 .2 .3 .3 .3 .2 .2 .3 .4 .5
.3 .3 .3 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .2 .1 .0 .1 .2 .2 .2 .2 .2 .1 .2 .1 .2 .2 .2 .3 .3 .3 .3
.1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .1 .2 .2 .2 .2 .2 .2 .3 .2 .2 .2 .1 .2 .3 .2 .2 .2
.0 .0 .1 .1 .2 .2 .2 .2 .2 .1 .1 .1 .1 .2 .2 .3 .3 .3 .3 .1 .1 .1 .1 .2 .3 .3 .5 .4 .2 .2 .2 .2 .1 .1 .1 .1
.0 .0 .0 .1 .1 .2 .1 .2 .1 .1 .1 .1 .1 .2 .3 .3 .2 .2 .3 .2 .0 .1 .1 .2 .3 .3 .3 .2 .2 .2 .1 .1 .0 .0 .0 .0
.1 .1 .1 .1 .1 .2 .1 .1 .2 .1 .1 .0 .0 .1 .2 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .1 .1 .1 .1 .1 .0 .1 .1 .0
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .3 .3 .4 .4 .4 .4 .3 .3 .2 .1 .1 .1 .2 .2 .2 .1 .1 .1 .1 .1
.5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .4 .6 .6 .5 .5 .5 .4 .3 .2 .3 .3 .3 .3 .2 .2 .2 .2 .3
.4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .4 .5 .6 .5 .5 .4 .3 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3
.1 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .0 -.1 -.1 .1 .2 .2 .2 .2 .1 .0 .0 -.1 -.1 -.2 -.2 -.2 -.1 .0 .0 .0 .0
-.4 -.4 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.5 -.5 -.5 -.4 -.4 -.4 -.4 -.4 -.5 -.5 -.5 -.6 -.6 -.7 -.7 -.6 -.5 -.4 -.3 -.3 -.3
-.8 -.7 -.7 -.7 -.7 -.6 -.6 -.6 -.6 -.6 -.6 -.7 -.6 -.7 -.7 -.8 -.8 -.8 -.8 -.8 -.8 -.7 -.8 -.9 -.9 -.9 -.8 -.8 -.7 -.7 -.6 -.6 -.7 -.7 -.8 -.7
-.7 -.7 -.6 -.6 -.6 -.6 -.6 -.6 -.6 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.8 -.8 -.8 -.8 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.7 -.6 -.7 -.7 -.7

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3
.3	.3	.4	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.3	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.4	.3	.3
.4	.4	.4	.3	.4	.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.4	.4	.3	.4	.4	.3	.3	.4	.4	.3	.4	.5	.5	.4	.4	.4	.4	.3	.4	.4	.4
.3	.4	.3	.3	.4	.3	.3	.3	.3	.4	.3	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.3	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3
.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.4	.3	.5	.4	.4	.4	.4	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.5	.6	.4	.3	.3	.3	.4	.4	.3	.4	.4	.3	.4	.3	.3	.3
.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.4	.3	.3	.4	.4	.3	.3	.3	.3	.4
.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.3	.3	.4	.4	.3	.4	.4	.3	.3	.3	.3	.4
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.4	.3	.4	.3	.3	.4	.4	.3	.4	.4	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3
.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.3	.3	.3	.3
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.5	.5	.4	.4	.5	.4	.4	.4	.4	.4
.7	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5
1.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	1.9	3.0	3.6	2.8
.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4
.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3

Figure 55. ATOVS mean daily count. AUGUST 2003
NOAA17, using all observations
Global average number of observations in 24 hours = 530602



377	383	392	399	404	411	421	427	433	432	422	437	443	435	423	428	434	431	422	409	398	390	373	367	360	348	342	340	336	341	344	347	353	364	369	374
1115	1169	1192	1202	1204	1218	1258	1267	1283	1278	1287	1290	1226	1038	1058	1263	1282	1257	1204	1146	1102	1072	1049	1065	1062	1067	1061	1047	1022	1000	986	988	982	998	1027	1062
863	992	1081	1130	1132	1124	1106	1095	1097	1086	1092	1092	1110	1074	1101	1138	1141	1113	1011	876	787	816	901	1019	1087	1121	1118	1099	1076	1059	1033	1007	935	854	777	784
677	816	917	1018	1068	1030	929	855	879	956	1016	1049	1048	1054	1054	1051	1063	1041	881	700	676	818	969	1061	1082	1077	1047	1016	1031	1035	1042	1029	924	776	654	608
591	737	847	953	994	1001	930	865	893	926	985	1041	1025	1029	1029	1029	1048	972	751	615	718	885	1002	1065	1059	1059	1008	972	944	944	965	898	779	659	544	519
855	904	941	1016	966	1020	910	831	860	891	923	1054	1009	1036	977	1032	1038	883	675	597	776	894	990	1068	1027	783	347	243	305	363	427	541	674	714	564	650
905	998	1023	1024	935	1000	891	765	877	802	947	1016	1004	1045	954	1031	998	746	593	616	732	888	848	860	589	160	76	121	304	428	560	695	746	779	631	661
735	819	876	883	823	870	701	638	714	754	888	951	995	990	892	901	863	610	452	513	662	649	743	797	468	145	128	166	292	193	286	299	455	567	586	593
676	788	953	936	887	877	789	786	786	770	937	1003	1053	1001	919	878	825	605	479	535	611	913	953	883	664	421	442	536	604	699	585	604	568	603	546	517
711	838	928	826	830	719	721	777	808	1002	1033	1006	1080	1000	993	923	912	620	568	764	884	992	926	852	771	748	739	774	903	1038	964	902	691	487	627	603
701	906	1007	929	1008	909	859	793	761	908	955	998	1082	968	959	845	678	561	575	839	975	977	933	820	832	821	764	821	860	929	988	991	1024	886	771	618
643	874	1027	991	1048	962	997	984	889	969	900	995	1049	974	1003	870	651	532	600	832	956	968	1000	854	887	838	811	884	824	851	947	884	919	901	852	685
606	820	964	1014	1037	958	961	961	909	963	953	982	993	997	1005	857	640	593	691	893	1013	974	1016	937	941	936	887	951	909	954	1044	956	953	936	907	754
604	738	899	961	978	958	975	988	1019	984	1015	979	1004	1029	979	788	590	607	795	954	1035	1029	1022	971	997	1009	970	1006	1023	1016	1058	1015	1029	1032	990	748
697	676	824	951	1002	1025	1067	1069	1059	1049	1047	1058	1061	1041	942	746	625	713	874	995	1065	1055	1056	1041	1032	999	978	999	1036	1063	1077	1059	1053	1076	1036	839
912	846	865	936	1037	1091	1124	1139	1140	1134	1111	1016	1073	1010	919	824	810	897	1026	1093	1095	1116	1100	1062	1058	1000	1026	1088	1056	1019	1023	1006	1059	1094	1103	1019
948	924	859	785	783	766	821	929	902	853	796	766	872	780	838	831	874	831	785	703	655	641	503	621	1075	1062	725	322	344	406	421	723	896	972	905	928
211	203	190	201	230	257	273	212	139	252	308	306	277	269	303	263	252	236	209	226	257	190	68	28	24	27	31	37	88	157	250	306	303	313	341	244

Figure 56. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS8 (Surface)
NOAA17, using all observations

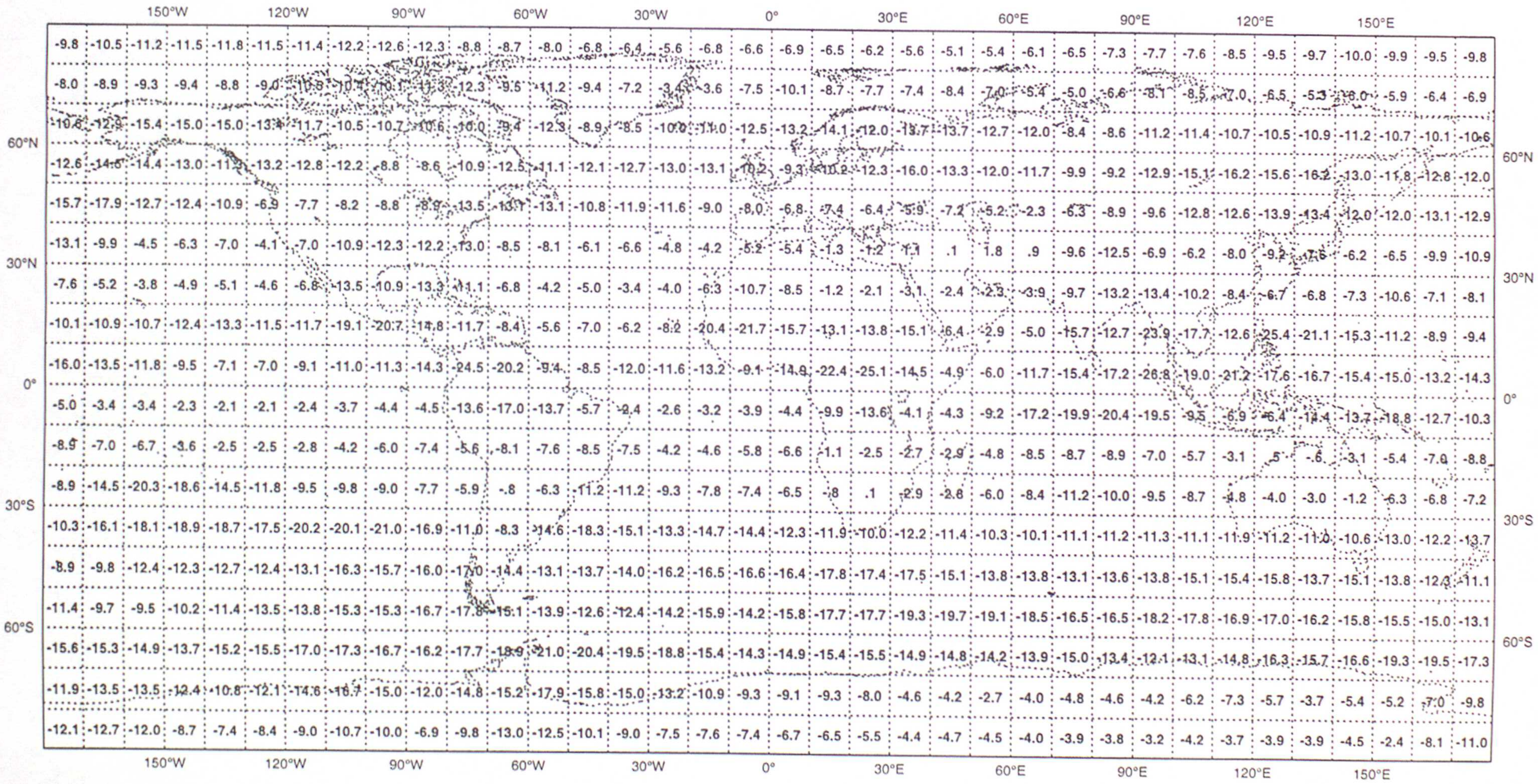
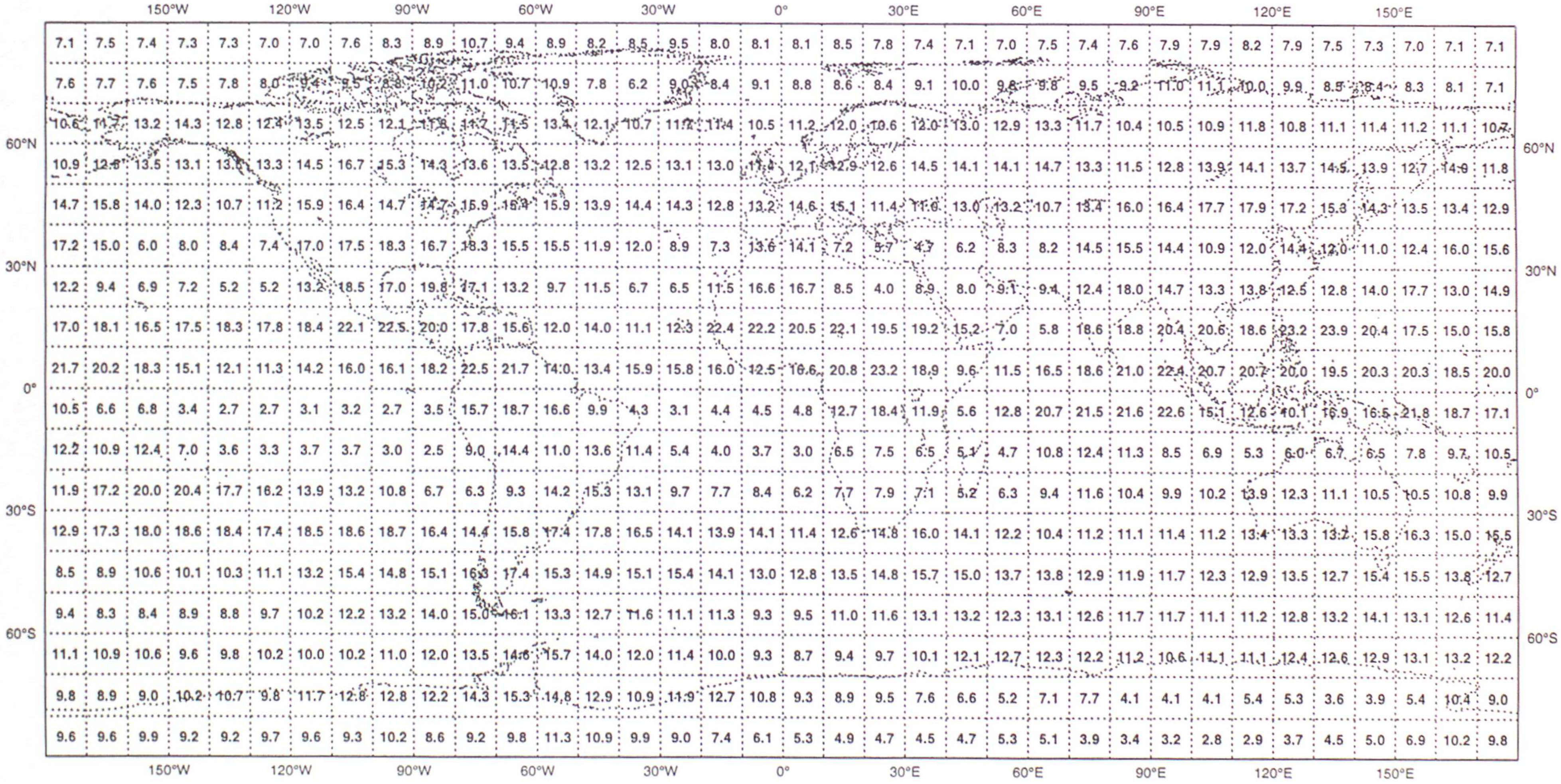

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-9.8 -10.5 -11.2 -11.5 -11.8 -11.5 -11.4 -12.2 -12.6 -12.3 -8.8 -8.7 -8.0 -6.8 -6.4 -5.6 -6.8 -6.6 -6.9 -6.5 -6.2 -5.6 -5.1 -5.4 -6.1 -6.5 -7.3 -7.7 -7.6 -8.5 -9.5 -9.7 -10.0 -9.9 -9.5 -9.8
-8.0 -8.9 -9.3 -9.4 -8.8 -9.0 -10.8 -10.4 -10.1 -11.3 -12.3 -9.5 -11.2 -9.4 -7.2 -3.4 -3.6 -7.5 -10.1 -8.7 -7.7 -7.4 -8.4 -7.0 -5.4 -5.0 -6.6 -8.1 -8.5 -7.0 -6.5 -5.3 -6.0 -5.9 -6.4 -6.9
-10.6 -12.9 -15.4 -15.0 -15.0 -13.4 -11.7 -10.5 -10.7 -10.6 -10.0 -9.4 -12.3 -8.9 -8.5 -10.0 -11.0 -12.5 -13.2 -14.1 -12.0 -13.7 -13.7 -12.7 -12.0 -8.4 -8.6 -11.2 -11.4 -10.7 -10.5 -10.9 -11.2 -10.7 -10.1 -10.6
-12.6 -14.6 -14.4 -13.0 -11.3 -13.2 -12.8 -12.2 -8.8 -8.6 -10.9 -12.5 -11.1 -12.1 -12.7 -13.0 -13.1 -10.2 -9.3 -10.2 -12.3 -16.0 -13.3 -12.0 -11.7 -9.9 -9.2 -12.9 -15.1 -16.2 -15.6 -16.2 -13.0 -11.8 -12.8 -12.0
-15.7 -17.9 -12.7 -12.4 -10.9 -6.9 -7.7 -8.2 -8.8 -8.9 -13.5 -13.1 -13.1 -10.8 -11.9 -11.6 -9.0 -8.0 -6.8 -7.4 -6.4 -5.9 -7.2 -5.2 -2.3 -6.3 -8.9 -9.6 -12.8 -12.6 -13.9 -13.4 -12.0 -12.0 -13.1 -12.9
-13.1 -9.9 -4.5 -6.3 -7.0 -4.1 -7.0 -10.9 -12.3 -12.2 -13.0 -8.5 -8.1 -6.1 -6.6 -4.8 -4.2 -5.2 -5.4 -1.3 -1.2 1.1 .1 1.8 .9 -9.6 -12.5 -6.9 -6.2 -8.0 -9.2 -7.6 -6.2 -6.5 -9.9 -10.9
-7.6 -5.2 -3.8 -4.9 -5.1 -4.6 -6.8 -13.5 -10.9 -13.3 -11.1 -6.8 -4.2 -5.0 -3.4 -4.0 -6.3 -10.7 -8.5 -1.2 -2.1 -3.1 -2.4 -2.3 -3.9 -9.7 -13.2 -13.4 -10.2 -8.4 -6.7 -6.8 -7.3 -10.6 -7.1 -8.1
-10.1 -10.9 -10.7 -12.4 -13.3 -11.5 -11.7 -19.1 -20.7 -14.8 -11.7 -8.4 -5.6 -7.0 -6.2 -8.2 -20.4 -21.7 -15.7 -13.1 -13.8 -15.1 -6.4 -2.9 -5.0 -15.7 -12.7 -23.9 -17.7 -12.6 -25.4 -21.1 -15.3 -11.2 -8.9 -9.4
-16.0 -13.5 -11.8 -9.5 -7.1 -7.0 -9.1 -11.0 -11.3 -14.3 -24.5 -20.2 -9.4 -8.5 -12.0 -11.6 -13.2 -9.1 -14.9 -22.4 -25.1 -14.5 -4.9 -6.0 -11.7 -15.4 -17.2 -26.8 -19.0 -21.2 -17.6 -16.7 -15.4 -15.0 -13.2 -14.3
-5.0 -3.4 -3.4 -2.3 -2.1 -2.1 -2.4 -3.7 -4.4 -4.5 -13.6 -17.0 -13.7 -5.7 -2.4 -2.6 -3.2 -3.9 -4.4 -9.9 -13.6 -4.1 -4.3 -9.2 -17.2 -19.9 -20.4 -19.5 -9.5 -6.9 -6.4 -14.4 -13.7 -18.8 -12.7 -10.3
-8.9 -7.0 -6.7 -3.6 -2.5 -2.5 -2.8 -4.2 -6.0 -7.4 -5.6 -8.1 -7.6 -8.5 -7.5 -4.2 -4.6 -5.8 -6.6 -1.1 -2.5 -2.7 -2.9 -4.8 -8.5 -8.7 -8.9 -7.0 -5.7 -3.1 .5 -.6 -3.1 -5.4 -7.0 -8.8
-8.9 -14.5 -20.3 -18.6 -14.5 -11.8 -9.5 -9.8 -9.0 -7.7 -5.9 -.8 -6.3 -11.2 -11.2 -9.3 -7.8 -7.4 -6.5 -.8 .1 -2.9 -2.8 -6.0 -8.4 -11.2 -10.0 -9.5 -8.7 -4.8 -4.0 -3.0 -1.2 -6.3 -6.8 -7.2
-10.3 -16.1 -18.1 -18.9 -18.7 -17.5 -20.2 -20.1 -21.0 -16.9 -11.0 -8.3 -14.6 -18.3 -15.1 -13.3 -14.7 -14.4 -12.3 -11.9 -10.0 -12.2 -11.4 -10.3 -10.1 -11.1 -11.2 -11.3 -11.1 -11.9 -11.2 -11.0 -10.6 -13.0 -12.2 -13.7
-8.9 -9.8 -12.4 -12.3 -12.7 -12.4 -13.1 -16.3 -15.7 -16.0 -17.0 -14.4 -13.1 -13.7 -14.0 -16.2 -16.5 -16.6 -16.4 -17.8 -17.4 -17.5 -15.1 -13.8 -13.8 -13.1 -13.6 -13.8 -15.1 -15.4 -15.8 -13.7 -15.1 -13.8 -12.3 -11.1
-11.4 -9.7 -9.5 -10.2 -11.4 -13.5 -13.8 -15.3 -15.3 -16.7 -17.8 -15.1 -13.9 -12.6 -12.4 -14.2 -15.9 -14.2 -15.8 -17.7 -17.7 -19.3 -19.7 -19.1 -18.5 -16.5 -16.5 -18.2 -17.8 -16.9 -17.0 -16.2 -15.8 -15.5 -15.0 -13.1
-15.6 -15.3 -14.9 -13.7 -15.2 -15.5 -17.0 -17.3 -16.7 -16.2 -17.7 -18.9 -21.0 -20.4 -19.5 -18.8 -15.4 -14.3 -14.9 -15.4 -15.5 -14.9 -14.8 -14.2 -13.9 -15.0 -13.4 -12.1 -13.1 -14.8 -16.3 -15.7 -16.6 -19.3 -19.5 -17.3
-11.9 -13.5 -13.5 -12.4 -10.8 -12.1 -14.6 -16.7 -15.0 -12.0 -14.8 -15.2 -17.9 -15.8 -15.0 -13.2 -10.9 -9.3 -9.1 -9.3 -8.0 -4.6 -4.2 -2.7 -4.0 -4.8 -4.6 -4.2 -6.2 -7.3 -5.7 -3.7 -5.4 -5.2 -7.0 -9.8
-12.1 -12.7 -12.0 -8.7 -7.4 -8.4 -9.0 -10.7 -10.0 -6.9 -9.8 -13.0 -12.5 -10.1 -9.0 -7.5 -7.6 -7.4 -6.7 -6.5 -5.5 -4.4 -4.7 -4.5 -4.0 -3.9 -3.8 -3.2 -4.2 -3.7 -3.9 -3.9 -4.5 -2.4 -8.1 -11.0

Figure 57. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS8 (Surface)
NOAA17, using all observations



7.1	7.5	7.4	7.3	7.3	7.0	7.0	7.6	8.3	8.9	10.7	9.4	8.9	8.2	8.5	9.5	8.0	8.1	8.1	8.5	7.8	7.4	7.1	7.0	7.5	7.4	7.6	7.9	7.9	8.2	7.9	7.5	7.3	7.0	7.1	7.1
7.6	7.7	7.6	7.5	7.8	8.0	9.4	9.5	8.8	10.2	11.0	10.7	10.9	7.8	6.2	9.0	8.4	9.1	8.8	8.6	8.4	9.1	10.0	9.8	9.8	9.5	9.2	11.0	11.1	10.0	9.9	8.5	8.4	8.3	8.1	7.1
10.6	11.7	13.2	14.3	12.8	12.4	13.5	12.5	12.1	11.8	11.7	11.5	13.4	12.1	10.7	11.2	11.4	10.5	11.2	12.0	10.6	12.0	13.0	12.9	13.3	11.7	10.4	10.5	10.9	11.8	10.8	11.1	11.4	11.2	11.1	10.7
10.9	12.6	13.5	13.1	13.6	13.3	14.5	16.7	15.3	14.3	13.6	13.5	12.8	13.2	12.5	13.1	13.0	11.4	12.1	12.9	12.6	14.5	14.1	14.1	14.7	13.3	11.5	12.8	13.9	14.1	13.7	14.5	13.9	12.7	14.9	11.8
14.7	15.8	14.0	12.3	10.7	11.2	15.9	16.4	14.7	14.7	15.9	15.4	15.9	13.9	14.4	14.3	12.8	13.2	14.6	15.1	11.4	11.6	13.0	13.2	10.7	13.4	16.0	16.4	17.7	17.9	17.2	15.3	14.3	13.5	13.4	12.9
17.2	15.0	6.0	8.0	8.4	7.4	17.0	17.5	18.3	16.7	18.3	15.5	15.5	11.9	12.0	8.9	7.3	13.6	14.1	7.2	5.7	4.7	6.2	8.3	8.2	14.5	15.5	14.4	10.9	12.0	14.4	12.0	11.0	12.4	16.0	15.6
12.2	9.4	6.9	7.2	5.2	5.2	13.2	18.5	17.0	19.8	17.1	13.2	9.7	11.5	6.7	6.5	11.5	16.6	16.7	8.5	4.0	8.9	8.0	9.1	9.4	12.4	18.0	14.7	13.3	13.8	12.5	12.8	14.0	17.7	13.0	14.9
17.0	18.1	16.5	17.5	18.3	17.8	18.4	22.1	22.5	20.0	17.8	15.6	12.0	14.0	11.1	12.3	22.4	22.2	20.5	22.1	19.5	19.2	15.2	7.0	5.8	18.6	18.8	20.4	20.6	18.6	23.2	23.9	20.4	17.5	15.0	15.8
21.7	20.2	18.3	15.1	12.1	11.3	14.2	16.0	16.1	18.2	22.5	21.7	14.0	13.4	15.9	15.8	16.0	12.5	16.6	20.8	23.2	18.9	9.6	11.5	16.5	18.6	21.0	22.4	20.7	20.7	20.0	19.5	20.3	20.3	18.5	20.0
10.5	6.6	6.8	3.4	2.7	2.7	3.1	3.2	2.7	3.5	15.7	18.7	16.6	9.9	4.3	3.1	4.4	4.5	4.8	12.7	18.4	11.9	5.6	12.8	20.7	21.5	21.6	22.6	15.1	12.6	10.1	16.9	16.5	21.8	18.7	17.1
12.2	10.9	12.4	7.0	3.6	3.3	3.7	3.7	3.0	2.5	9.0	14.4	11.0	13.6	11.4	5.4	4.0	3.7	3.0	6.5	7.5	6.5	5.1	4.7	10.8	12.4	11.3	8.5	6.9	5.3	6.0	6.7	6.5	7.8	9.7	10.5
11.9	17.2	20.0	20.4	17.7	16.2	13.9	13.2	10.8	6.7	6.3	9.3	14.2	15.3	13.1	9.7	7.7	8.4	6.2	7.7	7.9	7.1	5.2	6.3	9.4	11.6	10.4	9.9	10.2	13.9	12.3	11.1	10.5	10.5	10.8	9.9
12.9	17.3	18.0	18.6	18.4	17.4	18.5	18.6	18.7	16.4	14.4	15.8	17.4	17.8	16.5	14.1	13.9	14.1	11.4	12.6	14.8	16.0	14.1	12.2	10.4	11.2	11.1	11.4	11.2	13.4	13.3	13.2	15.8	16.3	15.0	15.5
8.5	8.9	10.6	10.1	10.3	11.1	13.2	15.4	14.8	15.1	16.3	17.4	15.3	14.9	15.1	15.4	14.1	13.0	12.8	13.5	14.8	15.7	15.0	13.7	13.8	12.9	11.9	11.7	12.3	12.9	13.5	12.7	15.4	15.5	13.8	12.7
9.4	8.3	8.4	8.9	8.8	9.7	10.2	12.2	13.2	14.0	15.0	16.1	13.3	12.7	11.6	11.1	11.3	9.3	9.5	11.0	11.6	13.1	13.2	12.3	13.1	12.6	11.7	11.7	11.1	11.2	12.8	13.2	14.1	13.1	12.6	11.4
11.1	10.9	10.6	9.6	9.8	10.2	10.0	10.2	11.0	12.0	13.5	14.6	15.7	14.0	12.0	11.4	10.0	9.3	8.7	9.4	9.7	10.1	12.1	12.7	12.3	12.2	11.2	10.6	11.1	11.1	12.4	12.6	12.9	13.1	13.2	12.2
9.8	8.9	9.0	10.2	10.7	9.8	11.7	12.8	12.8	12.2	14.3	15.3	14.8	12.9	10.9	11.9	12.7	10.8	9.3	8.9	9.5	7.6	6.6	5.2	7.1	7.7	4.1	4.1	4.1	5.4	5.3	3.6	3.9	5.4	10.4	9.0
9.6	9.6	9.9	9.2	9.2	9.7	9.6	9.3	10.2	8.6	9.2	9.8	11.3	10.9	9.9	9.0	7.4	6.1	5.3	4.9	4.7	4.5	4.7	5.3	5.1	3.9	3.4	3.2	2.8	2.9	3.7	4.5	5.0	6.9	10.2	9.8

Figure 58. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS15 (700 hPa)
NOAA17, using all observations

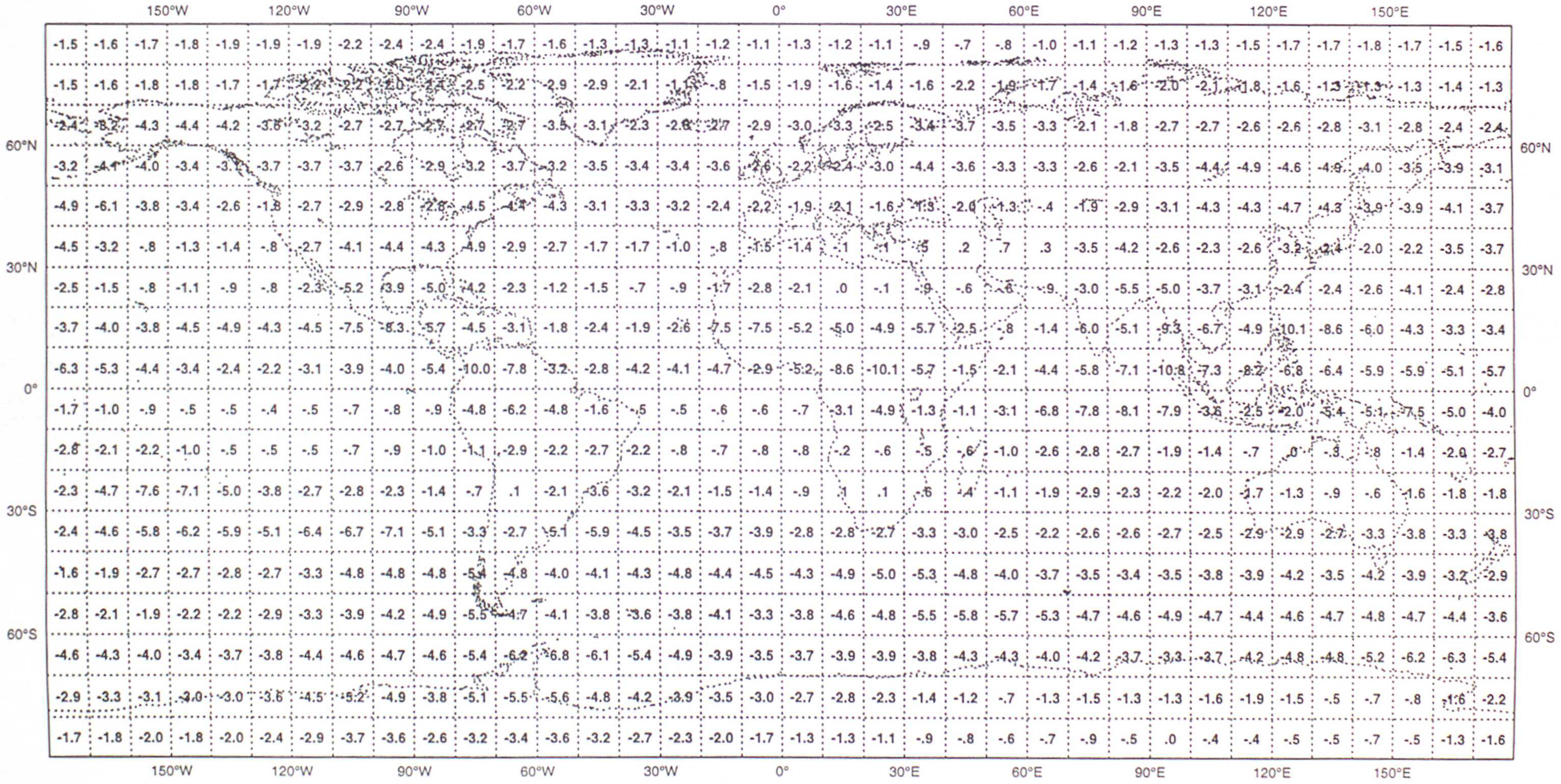
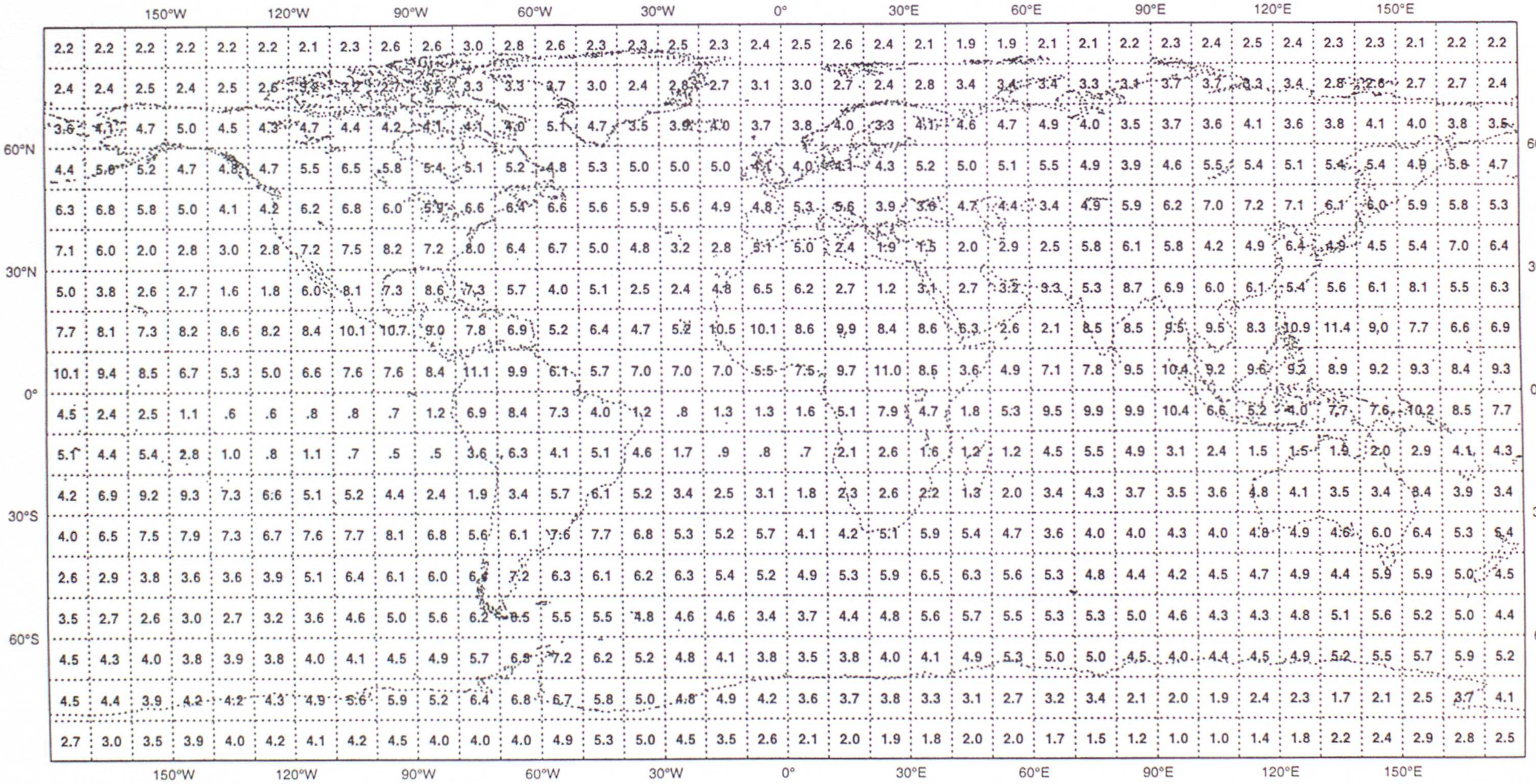
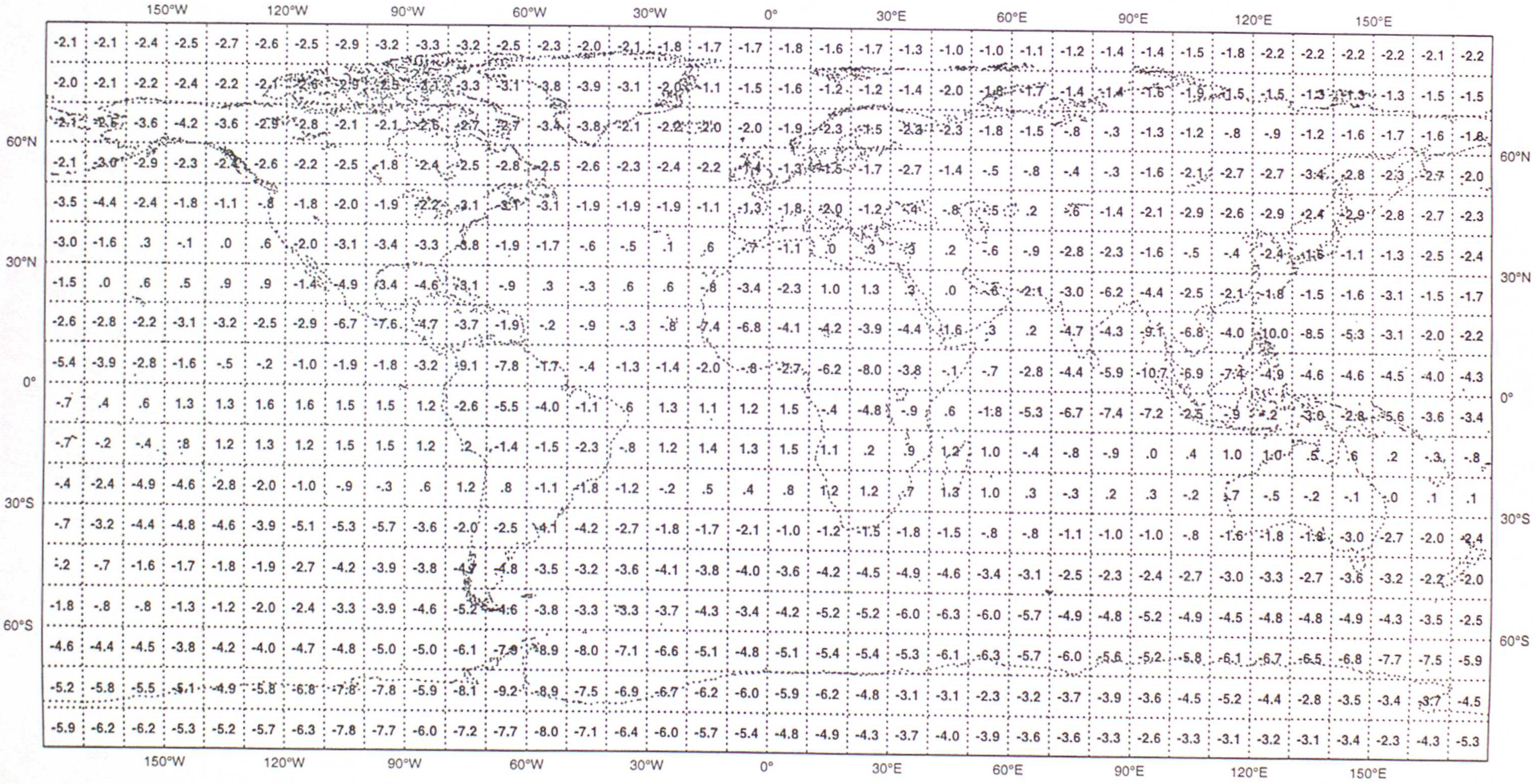

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-1.5 -1.6 -1.7 -1.8 -1.9 -1.9 -1.9 -2.2 -2.4 -2.4 -1.9 -1.7 -1.6 -1.3 -1.3 -1.1 -1.2 -1.1 -1.3 -1.2 -1.1 -.9 -.7 -.8 -1.0 -1.1 -1.2 -1.3 -1.3 -1.5 -1.7 -1.7 -1.8 -1.7 -1.5 -1.6
-1.5 -1.6 -1.8 -1.8 -1.7 -1.7 -2.2 -2.2 -2.0 -2.4 -2.5 -2.2 -2.9 -2.9 -2.1 -1.1 -.8 -1.5 -1.9 -1.6 -1.4 -1.6 -2.2 -1.9 -1.7 -1.4 -1.6 -2.0 -2.1 -1.8 -1.6 -1.3 -1.3 -1.3 -1.4 -1.3
-2.4 -3.2 -4.3 -4.4 -4.2 -3.6 -3.2 -2.7 -2.7 -2.7 -2.7 -2.7 -3.5 -3.1 -2.3 -2.8 -2.7 -2.9 -3.0 -3.3 -2.5 -3.4 -3.7 -3.5 -3.3 -2.1 -1.8 -2.7 -2.7 -2.6 -2.6 -2.8 -3.1 -2.8 -2.4 -2.4
-3.2 -4.1 -4.0 -3.4 -3.1 -3.7 -3.7 -3.7 -2.6 -2.9 -3.2 -3.7 -3.2 -3.5 -3.4 -3.4 -3.6 -2.6 -2.2 -2.4 -3.0 -4.4 -3.6 -3.3 -3.3 -2.6 -2.1 -3.5 -4.4 -4.9 -4.6 -4.9 -4.0 -3.5 -3.9 -3.1
-4.9 -6.1 -3.8 -3.4 -2.6 -1.8 -2.7 -2.9 -2.8 -2.8 -4.5 -4.4 -4.3 -3.1 -3.3 -3.2 -2.4 -2.2 -1.9 -2.1 -1.6 -1.3 -2.0 -1.3 -.4 -1.9 -2.9 -3.1 -4.3 -4.3 -4.7 -4.3 -3.9 -3.9 -4.1 -3.7
-4.5 -3.2 -.8 -1.3 -1.4 -.8 -2.7 -4.1 -4.4 -4.3 -4.9 -2.9 -2.7 -1.7 -1.7 -1.0 -.8 -1.5 -1.4 -.1 -.1 -.5 .2 .7 .3 -3.5 -4.2 -2.6 -2.3 -2.6 -3.2 -2.4 -2.0 -2.2 -3.5 -3.7
-2.5 -1.5 -.8 -1.1 -.9 -.8 -2.3 -5.2 -3.9 -5.0 -4.2 -2.3 -1.2 -1.5 -.7 -.9 -1.7 -2.8 -2.1 .0 -.1 -.9 -.6 -.6 -.9 -3.0 -5.5 -5.0 -3.7 -3.1 -2.4 -2.4 -2.6 -4.1 -2.4 -2.8
-3.7 -4.0 -3.8 -4.5 -4.9 -4.3 -4.5 -7.5 -8.3 -5.7 -4.5 -3.1 -1.8 -2.4 -1.9 -2.6 -7.5 -7.5 -5.2 -5.0 -4.9 -5.7 -2.5 -.8 -1.4 -6.0 -5.1 -9.3 -6.7 -4.9 -10.1 -8.6 -6.0 -4.3 -3.3 -3.4
-6.3 -5.3 -4.4 -3.4 -2.4 -2.2 -3.1 -3.9 -4.0 -5.4 -10.0 -7.8 -3.2 -2.8 -4.2 -4.1 -4.7 -2.9 -5.2 -8.6 -10.1 -5.7 -1.5 -2.1 -4.4 -5.8 -7.1 -10.8 -7.3 -8.2 -6.8 -6.4 -5.9 -5.9 -5.1 -5.7
-1.7 -1.0 -.9 -.5 -.5 -.4 -.5 -.7 -.8 -.9 -4.8 -6.2 -4.8 -1.6 -.5 -.5 -.6 -.6 -.7 -3.1 -4.9 -1.3 -1.1 -3.1 -6.8 -7.8 -8.1 -7.9 -3.6 -2.5 -2.0 -5.4 -5.1 -7.5 -5.0 -4.0
-2.8 -2.1 -2.2 -1.0 -.5 -.5 -.5 -.7 -.9 -1.0 -1.1 -2.9 -2.2 -2.7 -2.2 -.8 -.7 -.8 -.8 -.2 -.6 -.5 -.6 -1.0 -2.6 -2.8 -2.7 -1.9 -1.4 -.7 .0 -.3 -.8 -1.4 -2.0 -2.7
-2.3 -4.7 -7.6 -7.1 -5.0 -3.8 -2.7 -2.8 -2.3 -1.4 -.7 .1 -2.1 -3.6 -3.2 -2.1 -1.5 -1.4 -.9 .1 .1 -.6 -.4 -1.1 -1.9 -2.9 -2.3 -2.2 -2.0 -1.7 -1.3 -.9 -.6 -1.6 -1.8 -1.8
-2.4 -4.6 -5.8 -6.2 -5.9 -5.1 -6.4 -6.7 -7.1 -5.1 -3.3 -2.7 -5.1 -5.9 -4.5 -3.5 -3.7 -3.9 -2.8 -2.8 -2.7 -3.3 -3.0 -2.5 -2.2 -2.6 -2.6 -2.7 -2.5 -2.9 -2.9 -2.7 -3.3 -3.8 -3.3 -3.8
-1.6 -1.9 -2.7 -2.7 -2.8 -2.7 -3.3 -4.8 -4.8 -4.8 -5.4 -4.8 -4.0 -4.1 -4.3 -4.8 -4.4 -4.5 -4.3 -4.9 -5.0 -5.3 -4.8 -4.0 -3.7 -3.5 -3.4 -3.5 -3.8 -3.9 -4.2 -3.5 -4.2 -3.9 -3.2 -2.9
-2.8 -2.1 -1.9 -2.2 -2.2 -2.9 -3.3 -3.9 -4.2 -4.9 -5.5 -4.7 -4.1 -3.8 -3.6 -3.8 -4.1 -3.3 -3.8 -4.6 -4.8 -5.5 -5.8 -5.7 -5.3 -4.7 -4.6 -4.9 -4.7 -4.4 -4.6 -4.7 -4.8 -4.7 -4.4 -3.6
-4.6 -4.3 -4.0 -3.4 -3.7 -3.8 -4.4 -4.6 -4.7 -4.6 -5.4 -6.2 -6.8 -6.1 -5.4 -4.9 -3.9 -3.5 -3.7 -3.9 -3.9 -3.8 -4.3 -4.3 -4.0 -4.2 -3.7 -3.3 -3.7 -4.2 -4.8 -4.8 -5.2 -6.2 -6.3 -5.4
-2.9 -3.3 -3.1 -4.0 -3.0 -3.6 -4.5 -5.2 -4.9 -3.8 -5.1 -5.5 -5.6 -4.8 -4.2 -3.9 -3.5 -3.0 -2.7 -2.8 -2.3 -1.4 -1.2 -.7 -1.3 -1.5 -1.3 -1.3 -1.6 -1.9 -1.5 -.5 -.7 -.8 -1.6 -2.2
-1.7 -1.8 -2.0 -1.8 -2.0 -2.4 -2.9 -3.7 -3.6 -2.6 -3.2 -3.4 -3.6 -3.2 -2.7 -2.3 -2.0 -1.7 -1.3 -1.3 -1.1 -.9 -.8 -.6 -.7 -.9 -.5 .0 -.4 -.4 -.5 -.5 -.7 -.5 -1.3 -1.6

Figure 59. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS15 (700 hPa)
NOAA17, using all observations



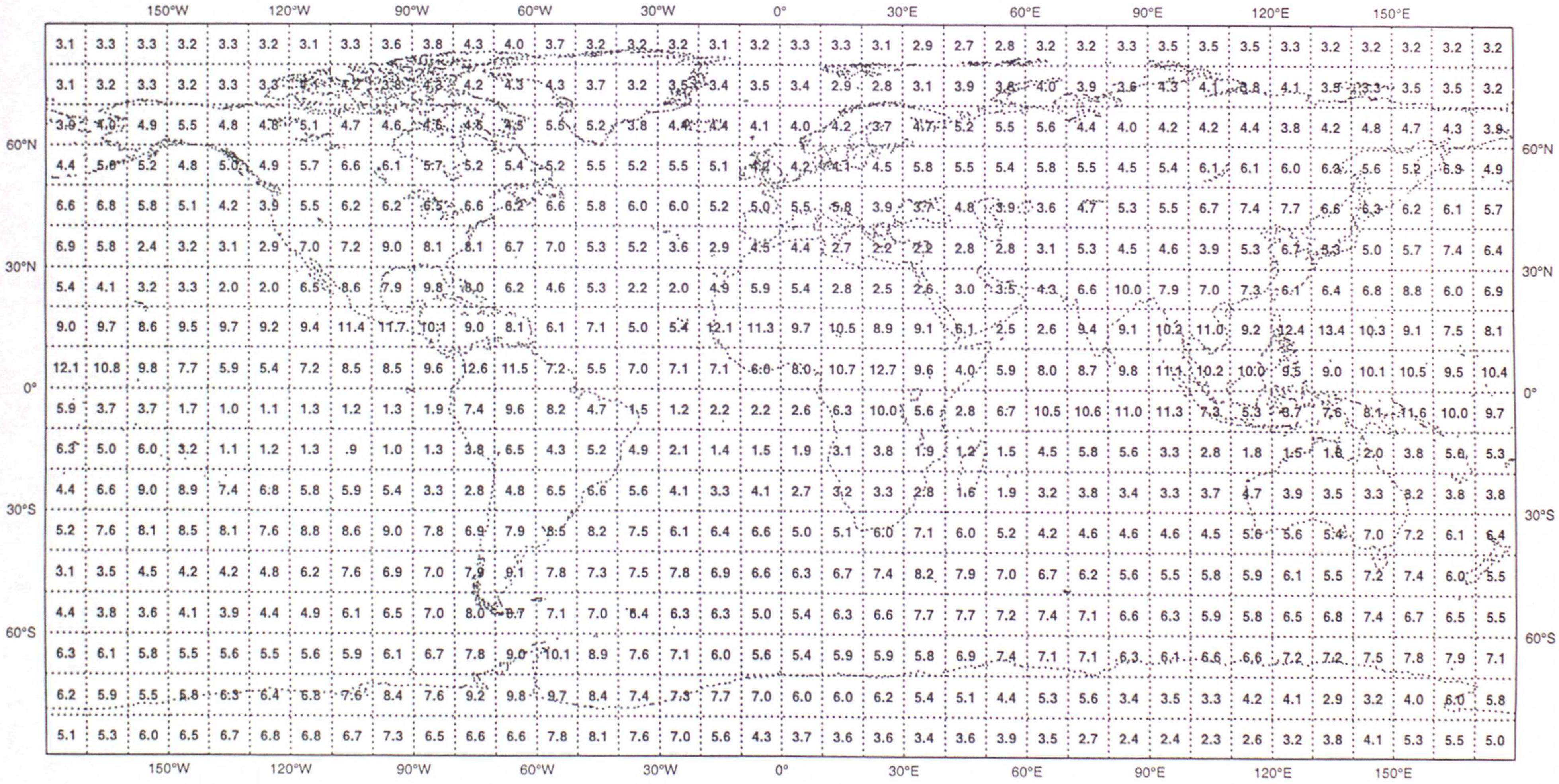
2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.6	2.6	3.0	2.8	2.6	2.3	2.3	2.5	2.3	2.4	2.5	2.6	2.4	2.1	1.9	1.9	2.1	2.1	2.2	2.3	2.4	2.5	2.4	2.3	2.3	2.1	2.2	2.2
2.4	2.4	2.5	2.4	2.5	2.6	3.2	3.2	2.7	3.2	3.3	3.3	3.7	3.0	2.4	2.8	2.7	3.1	3.0	2.7	2.4	2.8	3.4	3.4	3.4	3.3	3.1	3.7	3.7	3.3	3.4	2.8	2.6	2.7	2.7	2.4
3.6	4.1	4.7	5.0	4.5	4.3	4.7	4.4	4.2	4.1	4.1	4.0	5.1	4.7	3.5	3.9	4.0	3.7	3.8	4.0	3.3	4.1	4.6	4.7	4.9	4.0	3.5	3.7	3.6	4.1	3.6	3.8	4.1	4.0	3.8	3.5
4.4	5.6	5.2	4.7	4.8	4.7	5.5	6.5	5.8	5.4	5.1	5.2	4.8	5.3	5.0	5.0	5.0	4.1	4.0	4.1	4.3	5.2	5.0	5.1	5.5	4.9	3.9	4.6	5.5	5.4	5.1	5.4	5.4	4.9	5.8	4.7
6.3	6.8	5.8	5.0	4.1	4.2	6.2	6.8	6.0	5.9	6.6	6.4	6.6	5.6	5.9	5.6	4.9	4.8	5.3	5.6	3.9	3.6	4.7	4.4	3.4	4.9	5.9	6.2	7.0	7.2	7.1	6.1	6.0	5.9	5.8	5.3
7.1	6.0	2.0	2.8	3.0	2.8	7.2	7.5	8.2	7.2	8.0	6.4	6.7	5.0	4.8	3.2	2.8	5.1	5.0	2.4	1.9	1.5	2.0	2.9	2.5	5.8	6.1	5.8	4.2	4.9	6.4	4.9	4.5	5.4	7.0	6.4
5.0	3.8	2.6	2.7	1.6	1.8	6.0	8.1	7.3	8.6	7.3	5.7	4.0	5.1	2.5	2.4	4.8	6.5	6.2	2.7	1.2	3.1	2.7	3.2	3.3	5.3	8.7	6.9	6.0	6.1	5.4	5.6	6.1	8.1	5.5	6.3
7.7	8.1	7.3	8.2	8.6	8.2	8.4	10.1	10.7	9.0	7.8	6.9	5.2	6.4	4.7	5.2	10.5	10.1	8.6	9.9	8.4	8.6	6.3	2.6	2.1	8.5	8.5	9.5	9.5	8.3	10.9	11.4	9.0	7.7	6.6	6.9
10.1	9.4	8.5	6.7	5.3	5.0	6.6	7.6	7.6	8.4	11.1	9.9	6.1	5.7	7.0	7.0	7.0	5.5	7.5	9.7	11.0	8.5	3.6	4.9	7.1	7.8	9.5	10.4	9.2	9.6	9.2	8.9	9.2	9.3	8.4	9.3
4.5	2.4	2.5	1.1	.6	.6	.8	.8	.7	1.2	6.9	8.4	7.3	4.0	1.2	.8	1.3	1.3	1.6	5.1	7.9	4.7	1.8	5.3	9.5	9.9	9.9	10.4	6.6	5.2	4.0	7.7	7.6	10.2	8.5	7.7
5.1	4.4	5.4	2.8	1.0	.8	1.1	.7	.5	.5	3.6	6.3	4.1	5.1	4.6	1.7	.9	.8	.7	2.1	2.6	1.6	1.2	1.2	4.5	5.5	4.9	3.1	2.4	1.5	1.5	1.9	2.0	2.9	4.1	4.3
4.2	6.9	9.2	9.3	7.3	6.6	5.1	5.2	4.4	2.4	1.9	3.4	5.7	6.1	5.2	3.4	2.5	3.1	1.8	2.3	2.6	2.2	1.3	2.0	3.4	4.3	3.7	3.5	3.6	4.8	4.1	3.5	3.4	8.4	3.9	3.4
4.0	6.5	7.5	7.9	7.3	6.7	7.6	7.7	8.1	6.8	5.6	6.1	7.6	7.7	6.8	5.3	5.2	5.7	4.1	4.2	5.1	5.9	5.4	4.7	3.6	4.0	4.0	4.3	4.0	4.8	4.9	4.6	6.0	6.4	5.3	5.4
2.6	2.9	3.8	3.6	3.6	3.9	5.1	6.4	6.1	6.0	6.4	7.2	6.3	6.1	6.2	6.3	5.4	5.2	4.9	5.3	5.9	6.5	6.3	5.6	5.3	4.8	4.4	4.2	4.5	4.7	4.9	4.4	5.9	5.9	5.0	4.5
3.5	2.7	2.6	3.0	2.7	3.2	3.6	4.6	5.0	5.6	6.2	6.5	5.5	5.5	4.8	4.6	4.6	3.4	3.7	4.4	4.8	5.6	5.7	5.5	5.3	5.3	5.0	4.6	4.3	4.3	4.8	5.1	5.6	5.2	5.0	4.4
4.5	4.3	4.0	3.8	3.9	3.8	4.0	4.1	4.5	4.9	5.7	6.5	7.2	6.2	5.2	4.8	4.1	3.8	3.5	3.8	4.0	4.1	4.9	5.3	5.0	5.0	4.5	4.0	4.4	4.5	4.9	5.2	5.5	5.7	5.9	5.2
4.5	4.4	3.9	4.2	4.2	4.3	4.9	5.6	5.9	5.2	6.4	6.8	6.7	5.8	5.0	4.8	4.9	4.2	3.6	3.7	3.8	3.3	3.1	2.7	3.2	3.4	2.1	2.0	1.9	2.4	2.3	1.7	2.1	2.5	3.7	4.1
2.7	3.0	3.5	3.9	4.0	4.2	4.1	4.2	4.5	4.0	4.0	4.0	4.9	5.3	5.0	4.5	3.5	2.6	2.1	2.0	1.9	1.8	2.0	2.0	1.7	1.5	1.2	1.0	1.0	1.4	1.8	2.2	2.4	2.9	2.8	2.5

Figure 60. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA17, using all observations



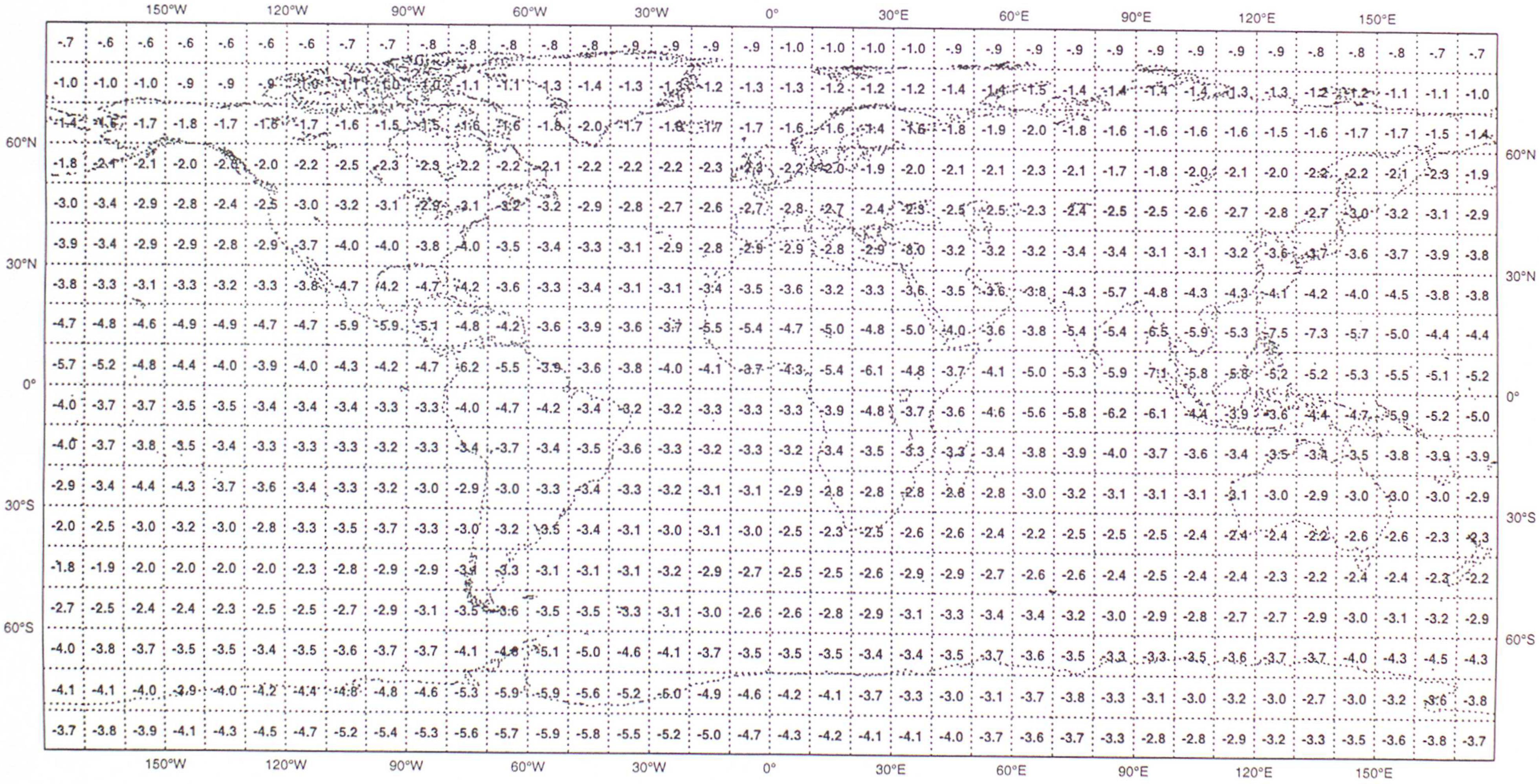
-2.1	-2.1	-2.4	-2.5	-2.7	-2.6	-2.5	-2.9	-3.2	-3.3	-3.2	-2.5	-2.3	-2.0	-2.1	-1.8	-1.7	-1.7	-1.8	-1.6	-1.7	-1.3	-1.0	-1.0	-1.1	-1.2	-1.4	-1.4	-1.5	-1.8	-2.2	-2.2	-2.2	-2.2	-2.1	-2.2
-2.0	-2.1	-2.2	-2.4	-2.2	-2.1	-2.6	-2.9	-2.5	-3.1	-3.3	-3.1	-3.8	-3.9	-3.1	-2.0	-1.1	-1.5	-1.6	-1.2	-1.2	-1.4	-2.0	-1.8	-1.7	-1.4	-1.4	-1.6	-1.9	-1.5	-1.5	-1.3	-1.3	-1.3	-1.5	-1.5
-2.1	-2.6	-3.6	-4.2	-3.6	-2.9	-2.8	-2.1	-2.1	-2.6	-2.7	-2.7	-3.4	-3.8	-2.1	-2.2	-2.0	-2.0	-1.9	-2.3	-1.5	-2.3	-2.3	-1.8	-1.5	-.8	-.3	-1.3	-1.2	-.8	-.9	-1.2	-1.6	-1.7	-1.6	-1.8
-2.1	-3.0	-2.9	-2.3	-2.4	-2.6	-2.2	-2.5	-1.8	-2.4	-2.5	-2.8	-2.5	-2.6	-2.3	-2.4	-2.2	-1.4	-1.3	-1.5	-1.7	-2.7	-1.4	-.5	-.8	-.4	-.3	-1.6	-2.1	-2.7	-2.7	-3.4	-2.8	-2.3	-2.7	-2.0
-3.5	-4.4	-2.4	-1.8	-1.1	-.8	-1.8	-2.0	-1.9	-2.2	-3.1	-3.1	-3.1	-1.9	-1.9	-1.9	-1.1	-1.3	-1.8	-2.0	-1.2	-.4	-.8	-.5	.2	-.6	-1.4	-2.1	-2.9	-2.6	-2.9	-2.4	-2.9	-2.8	-2.7	-2.3
-3.0	-1.6	.3	-.1	.0	.6	-2.0	-3.1	-3.4	-3.3	-3.8	-1.9	-1.7	-.6	-.5	.1	.6	-.7	-1.1	.0	.3	.3	.2	-.6	-.9	-2.8	-2.3	-1.6	-.5	-.4	-2.4	-1.6	-1.1	-1.3	-2.5	-2.4
-1.5	.0	.6	.5	.9	.9	-1.4	-4.9	-3.4	-4.6	-3.1	-.9	.3	-.3	.6	.6	-.8	-3.4	-2.3	1.0	1.3	.3	.0	-.6	-2.1	-3.0	-6.2	-4.4	-2.5	-2.1	-1.8	-1.5	-1.6	-3.1	-1.5	-1.7
-2.6	-2.8	-2.2	-3.1	-3.2	-2.5	-2.9	-6.7	-7.6	-4.7	-3.7	-1.9	-.2	-.9	-.3	-.8	-7.4	-6.8	-4.1	-4.2	-3.9	-4.4	-1.6	.3	.2	-4.7	-4.3	-9.1	-6.8	-4.0	-10.0	-8.5	-5.3	-3.1	-2.0	-2.2
-5.4	-3.9	-2.8	-1.6	-.5	-.2	-1.0	-1.9	-1.8	-3.2	-9.1	-7.8	-1.7	-.4	-1.3	-1.4	-2.0	-.8	-2.7	-6.2	-8.0	-3.8	-.1	-.7	-2.8	-4.4	-5.9	-10.7	-6.9	-7.4	-4.9	-4.6	-4.6	-4.5	-4.0	-4.3
-.7	.4	.6	1.3	1.3	1.6	1.6	1.5	1.5	1.2	-2.6	-5.5	-4.0	-1.1	.6	1.3	1.1	1.2	1.5	-.4	-4.8	-.9	.6	-1.8	-5.3	-6.7	-7.4	-7.2	-2.5	-.9	.2	-3.0	-2.8	-5.6	-3.6	-3.4
-.7	-.2	-.4	.8	1.2	1.3	1.2	1.5	1.5	1.2	.2	-1.4	-1.5	-2.3	-.8	1.2	1.4	1.3	1.5	1.1	.2	.9	1.2	1.0	-.4	-.8	-.9	.0	.4	1.0	1.0	.5	.6	.2	-.3	-.8
-.4	-2.4	-4.9	-4.6	-2.8	-2.0	-1.0	-.9	-.3	.6	1.2	.8	-1.1	-1.8	-1.2	-.2	.5	.4	.8	1.2	1.2	.7	1.3	1.0	.3	-.3	.2	.3	-.2	.7	-.5	-.2	-.1	.0	.1	.1
-.7	-3.2	-4.4	-4.8	-4.6	-3.9	-5.1	-5.3	-5.7	-3.6	-2.0	-2.5	-4.1	-4.2	-2.7	-1.8	-1.7	-2.1	-1.0	-1.2	-1.5	-1.8	-1.5	-.8	-.8	-1.1	-1.0	-1.0	-.8	-1.6	-1.8	-1.8	-3.0	-2.7	-2.0	-2.4
.2	-.7	-1.6	-1.7	-1.8	-1.9	-2.7	-4.2	-3.9	-3.8	-4.7	-4.8	-3.5	-3.2	-3.6	-4.1	-3.8	-4.0	-3.6	-4.2	-4.5	-4.9	-4.6	-3.4	-3.1	-2.5	-2.3	-2.4	-2.7	-3.0	-3.3	-2.7	-3.6	-3.2	-2.2	-2.0
-1.8	-.8	-.8	-1.3	-1.2	-2.0	-2.4	-3.3	-3.9	-4.6	-5.2	-4.6	-3.8	-3.3	-3.3	-3.7	-4.3	-3.4	-4.2	-5.2	-5.2	-6.0	-6.3	-6.0	-5.7	-4.9	-4.8	-5.2	-4.9	-4.5	-4.8	-4.8	-4.9	-4.3	-3.5	-2.5
-4.6	-4.4	-4.5	-3.8	-4.2	-4.0	-4.7	-4.8	-5.0	-5.0	-6.1	-7.9	-8.9	-8.0	-7.1	-6.6	-5.1	-4.8	-5.1	-5.4	-5.4	-5.3	-6.1	-6.3	-5.7	-6.0	-5.6	-5.2	-5.8	-6.1	-6.7	-6.5	-6.8	-7.7	-7.5	-5.9
-5.2	-5.8	-5.5	-5.1	-4.9	-5.8	-6.8	-7.8	-7.8	-5.9	-8.1	-9.2	-8.9	-7.5	-6.9	-6.7	-6.2	-6.0	-5.9	-6.2	-4.8	-3.1	-3.1	-2.3	-3.2	-3.7	-3.9	-3.6	-4.5	-5.2	-4.4	-2.8	-3.5	-3.4	-3.7	-4.5
-5.9	-6.2	-6.2	-5.3	-5.2	-5.7	-6.3	-7.8	-7.7	-6.0	-7.2	-7.7	-8.0	-7.1	-6.4	-6.0	-5.7	-5.4	-4.8	-4.9	-4.3	-3.7	-4.0	-3.9	-3.6	-3.6	-3.3	-2.6	-3.3	-3.1	-3.2	-3.1	-3.4	-2.3	-4.3	-5.3

Figure 61. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA17, using all observations



3.1	3.3	3.3	3.2	3.3	3.2	3.1	3.3	3.6	3.8	4.3	4.0	3.7	3.2	3.2	3.2	3.1	3.2	3.3	3.3	3.1	2.9	2.7	2.8	3.2	3.2	3.3	3.5	3.5	3.5	3.3	3.2	3.2	3.2	3.2	3.2
3.1	3.2	3.3	3.2	3.3	3.3	4.1	4.2	3.8	4.3	4.2	4.3	4.3	3.7	3.2	3.5	3.4	3.5	3.4	2.9	2.8	3.1	3.9	3.8	4.0	3.9	3.6	4.3	4.1	3.8	4.1	3.5	3.3	3.5	3.5	3.2
3.9	4.0	4.9	5.5	4.8	4.8	5.1	4.7	4.6	4.6	4.6	4.5	5.5	5.2	3.8	4.4	4.4	4.1	4.0	4.2	3.7	4.7	5.2	5.5	5.6	4.4	4.0	4.2	4.2	4.4	3.8	4.2	4.8	4.7	4.3	3.9
4.4	5.6	5.2	4.8	5.0	4.9	5.7	6.6	6.1	5.7	5.2	5.4	5.2	5.5	5.2	5.5	5.1	4.2	4.2	4.1	4.5	5.8	5.5	5.4	5.8	5.5	4.5	5.4	6.1	6.1	6.0	6.3	5.6	5.2	6.9	4.9
6.6	6.8	5.8	5.1	4.2	3.9	5.5	6.2	6.2	6.5	6.6	6.2	6.6	5.8	6.0	6.0	5.2	5.0	5.5	5.8	3.9	3.7	4.8	3.9	3.6	4.7	5.3	5.5	6.7	7.4	7.7	6.6	6.3	6.2	6.1	5.7
6.9	5.8	2.4	3.2	3.1	2.9	7.0	7.2	9.0	8.1	8.1	6.7	7.0	5.3	5.2	3.6	2.9	4.5	4.4	2.7	2.2	2.2	2.8	2.8	3.1	5.3	4.5	4.6	3.9	5.3	6.7	5.3	5.0	5.7	7.4	6.4
5.4	4.1	3.2	3.3	2.0	2.0	6.5	8.6	7.9	9.8	8.0	6.2	4.6	5.3	2.2	2.0	4.9	5.9	5.4	2.8	2.5	2.6	3.0	3.5	4.3	6.6	10.0	7.9	7.0	7.3	6.1	6.4	6.8	8.8	6.0	6.9
9.0	9.7	8.6	9.5	9.7	9.2	9.4	11.4	11.7	10.1	9.0	8.1	6.1	7.1	5.0	5.4	12.1	11.3	9.7	10.5	8.9	9.1	6.1	2.5	2.6	9.4	9.1	10.2	11.0	9.2	12.4	13.4	10.3	9.1	7.5	8.1
12.1	10.8	9.8	7.7	5.9	5.4	7.2	8.5	8.5	9.6	12.6	11.5	7.2	5.5	7.0	7.1	7.1	6.0	8.0	10.7	12.7	9.6	4.0	5.9	8.0	8.7	9.8	11.1	10.2	10.0	9.5	9.0	10.1	10.5	9.5	10.4
5.9	3.7	3.7	1.7	1.0	1.1	1.3	1.2	1.3	1.9	7.4	9.6	8.2	4.7	1.5	1.2	2.2	2.2	2.6	6.3	10.0	5.6	2.8	6.7	10.5	10.6	11.0	11.3	7.3	5.3	8.7	7.6	8.1	11.6	10.0	9.7
6.3	5.0	6.0	3.2	1.1	1.2	1.3	.9	1.0	1.3	3.8	6.5	4.3	5.2	4.9	2.1	1.4	1.5	1.9	3.1	3.8	1.9	1.2	1.5	4.5	5.8	5.6	3.3	2.8	1.8	1.5	1.8	2.0	3.8	5.6	5.3
4.4	6.6	9.0	8.9	7.4	6.8	5.8	5.9	5.4	3.3	2.8	4.8	6.5	6.6	5.6	4.1	3.3	4.1	2.7	3.2	3.3	2.8	1.6	1.9	3.2	3.8	3.4	3.3	3.7	4.7	3.9	3.5	3.3	8.2	3.8	3.8
5.2	7.6	8.1	8.5	8.1	7.6	8.8	8.6	9.0	7.8	6.9	7.9	8.5	8.2	7.5	6.1	6.4	6.6	5.0	5.1	6.0	7.1	6.0	5.2	4.2	4.6	4.6	4.6	4.5	5.6	5.6	5.4	7.0	7.2	6.1	6.4
3.1	3.5	4.5	4.2	4.2	4.8	6.2	7.6	6.9	7.0	7.9	9.1	7.8	7.3	7.5	7.8	6.9	6.6	6.3	6.7	7.4	8.2	7.9	7.0	6.7	6.2	5.6	5.5	5.8	5.9	6.1	5.5	7.2	7.4	6.0	5.5
4.4	3.8	3.6	4.1	3.9	4.4	4.9	6.1	6.5	7.0	8.0	8.7	7.1	7.0	8.4	6.3	6.3	5.0	5.4	6.3	6.6	7.7	7.7	7.2	7.4	7.1	6.6	6.3	5.9	5.8	6.5	6.8	7.4	6.7	6.5	5.5
6.3	6.1	5.8	5.5	5.6	5.5	5.6	5.9	6.1	6.7	7.8	9.0	10.1	8.9	7.6	7.1	6.0	5.6	5.4	5.9	5.9	5.8	6.9	7.4	7.1	7.1	6.3	6.1	6.6	6.6	7.2	7.2	7.5	7.8	7.9	7.1
6.2	5.9	5.5	5.8	6.3	6.4	6.8	7.6	8.4	7.6	9.2	9.8	9.7	8.4	7.4	7.3	7.7	7.0	6.0	6.0	6.2	5.4	5.1	4.4	5.3	5.6	3.4	3.5	3.3	4.2	4.1	2.9	3.2	4.0	6.0	5.8
5.1	5.3	6.0	6.5	6.7	6.8	6.8	6.7	7.3	6.5	6.6	6.6	7.8	8.1	7.6	7.0	5.6	4.3	3.7	3.6	3.6	3.4	3.6	3.9	3.5	2.7	2.4	2.4	2.3	2.6	3.2	3.8	4.1	5.3	5.5	5.0

Figure 62. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS4 (400 hPa)
NOAA17, using all observations



-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.8	-.8	-.8	-.8	-.8	-.9	-.9	-.9	-.9	-1.0	-1.0	-1.0	-1.0	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.8	-.8	-.8	-.7	-.7
-1.0	-1.0	-1.0	-.9	-.9	-.9	-1.0	-1.1	-1.0	-1.0	-1.1	-1.1	-1.3	-1.4	-1.3	-1.3	-1.2	-1.3	-1.3	-1.2	-1.2	-1.2	-1.4	-1.4	-1.5	-1.4	-1.4	-1.4	-1.4	-1.3	-1.3	-1.2	-1.2	-1.1	-1.1	-1.0
-1.4	-1.6	-1.7	-1.8	-1.7	-1.6	-1.7	-1.6	-1.5	-1.5	-1.6	-1.6	-1.8	-2.0	-1.7	-1.8	-1.7	-1.7	-1.6	-1.6	-1.4	-1.6	-1.8	-1.9	-2.0	-1.8	-1.6	-1.6	-1.6	-1.6	-1.5	-1.6	-1.7	-1.7	-1.5	-1.4
-1.8	-2.1	-2.1	-2.0	-2.8	-2.0	-2.2	-2.5	-2.3	-2.9	-2.2	-2.2	-2.1	-2.2	-2.2	-2.2	-2.3	-2.3	-2.2	-2.0	-1.9	-2.0	-2.1	-2.1	-2.3	-2.1	-1.7	-1.8	-2.0	-2.1	-2.0	-2.2	-2.2	-2.1	-2.3	-1.9
-3.0	-3.4	-2.9	-2.8	-2.4	-2.5	-3.0	-3.2	-3.1	-2.9	-3.1	-3.2	-3.2	-2.9	-2.8	-2.7	-2.6	-2.7	-2.8	-2.7	-2.4	-2.3	-2.5	-2.5	-2.3	-2.4	-2.5	-2.5	-2.6	-2.7	-2.8	-2.7	-3.0	-3.2	-3.1	-2.9
-3.9	-3.4	-2.9	-2.9	-2.8	-2.9	-3.7	-4.0	-4.0	-3.8	-4.0	-3.5	-3.4	-3.3	-3.1	-2.9	-2.8	-2.9	-2.9	-2.8	-2.9	-3.0	-3.2	-3.2	-3.2	-3.4	-3.4	-3.1	-3.1	-3.2	-3.6	-3.7	-3.6	-3.7	-3.9	-3.8
-3.8	-3.3	-3.1	-3.3	-3.2	-3.3	-3.8	-4.7	-4.2	-4.7	-4.2	-3.6	-3.3	-3.4	-3.1	-3.1	-3.4	-3.5	-3.6	-3.2	-3.3	-3.6	-3.5	-3.6	-3.8	-4.3	-5.7	-4.8	-4.3	-4.3	-4.1	-4.2	-4.0	-4.5	-3.8	-3.8
-4.7	-4.8	-4.6	-4.9	-4.9	-4.7	-4.7	-5.9	-5.9	-5.1	-4.8	-4.2	-3.6	-3.9	-3.6	-3.7	-5.5	-5.4	-4.7	-5.0	-4.8	-5.0	-4.0	-3.6	-3.8	-5.4	-5.4	-6.5	-5.9	-5.3	-7.5	-7.3	-5.7	-5.0	-4.4	-4.4
-5.7	-5.2	-4.8	-4.4	-4.0	-3.9	-4.0	-4.3	-4.2	-4.7	-6.2	-5.5	-3.9	-3.6	-3.8	-4.0	-4.1	-3.7	-4.3	-5.4	-6.1	-4.8	-3.7	-4.1	-5.0	-5.3	-5.9	-7.1	-5.8	-5.8	-5.2	-5.2	-5.3	-5.5	-5.1	-5.2
-4.0	-3.7	-3.7	-3.5	-3.5	-3.4	-3.4	-3.4	-3.3	-3.3	-4.0	-4.7	-4.2	-3.4	-3.2	-3.2	-3.3	-3.3	-3.3	-3.9	-4.8	-3.7	-3.6	-4.6	-5.6	-5.8	-6.2	-6.1	-4.4	-3.9	-3.6	-4.4	-4.7	-5.9	-5.2	-5.0
-4.0	-3.7	-3.8	-3.5	-3.4	-3.3	-3.3	-3.3	-3.2	-3.3	-3.4	-3.7	-3.4	-3.5	-3.6	-3.3	-3.2	-3.3	-3.2	-3.4	-3.5	-3.3	-3.3	-3.4	-3.8	-3.9	-4.0	-3.7	-3.6	-3.4	-3.5	-3.4	-3.5	-3.8	-3.9	-3.9
-2.9	-3.4	-4.4	-4.3	-3.7	-3.6	-3.4	-3.3	-3.2	-3.0	-2.9	-3.0	-3.3	-3.4	-3.3	-3.2	-3.1	-3.1	-2.9	-2.8	-2.8	-2.8	-2.8	-2.8	-3.0	-3.2	-3.1	-3.1	-3.1	-3.1	-3.0	-2.9	-3.0	-3.0	-3.0	-2.9
-2.0	-2.5	-3.0	-3.2	-3.0	-2.8	-3.3	-3.5	-3.7	-3.3	-3.0	-3.2	-3.5	-3.4	-3.1	-3.0	-3.1	-3.0	-2.5	-2.3	-2.5	-2.6	-2.6	-2.4	-2.2	-2.5	-2.5	-2.5	-2.4	-2.4	-2.4	-2.2	-2.6	-2.6	-2.3	-2.3
-1.8	-1.9	-2.0	-2.0	-2.0	-2.0	-2.3	-2.8	-2.9	-2.9	-3.1	-3.3	-3.1	-3.1	-3.1	-3.2	-2.9	-2.7	-2.5	-2.5	-2.6	-2.9	-2.9	-2.7	-2.6	-2.6	-2.4	-2.5	-2.4	-2.4	-2.3	-2.2	-2.4	-2.4	-2.3	-2.2
-2.7	-2.5	-2.4	-2.4	-2.3	-2.5	-2.5	-2.7	-2.9	-3.1	-3.5	-3.6	-3.5	-3.5	-3.3	-3.1	-3.0	-2.6	-2.6	-2.8	-2.9	-3.1	-3.3	-3.4	-3.4	-3.2	-3.0	-2.9	-2.8	-2.7	-2.7	-2.9	-3.0	-3.1	-3.2	-2.9
-4.0	-3.8	-3.7	-3.5	-3.5	-3.4	-3.5	-3.6	-3.7	-3.7	-4.1	-4.8	-5.1	-5.0	-4.6	-4.1	-3.7	-3.5	-3.5	-3.5	-3.4	-3.4	-3.5	-3.7	-3.6	-3.5	-3.3	-3.3	-3.5	-3.6	-3.7	-3.7	-4.0	-4.3	-4.5	-4.3
-4.1	-4.1	-4.0	-3.9	-4.0	-4.2	-4.4	-4.8	-4.8	-4.6	-5.3	-5.9	-5.9	-5.6	-5.2	-6.0	-4.9	-4.6	-4.2	-4.1	-3.7	-3.3	-3.0	-3.1	-3.7	-3.8	-3.3	-3.1	-3.0	-3.2	-3.0	-2.7	-3.0	-3.2	-3.6	-3.8
-3.7	-3.8	-3.9	-4.1	-4.3	-4.5	-4.7	-5.2	-5.4	-5.3	-5.6	-5.7	-5.9	-5.8	-5.5	-5.2	-5.0	-4.7	-4.3	-4.2	-4.1	-4.1	-4.0	-3.7	-3.6	-3.7	-3.3	-2.8	-2.8	-2.9	-3.2	-3.3	-3.5	-3.6	-3.8	-3.7

Figure 63. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: HIRS4 (400 hPa)
NOAA17, using all observations

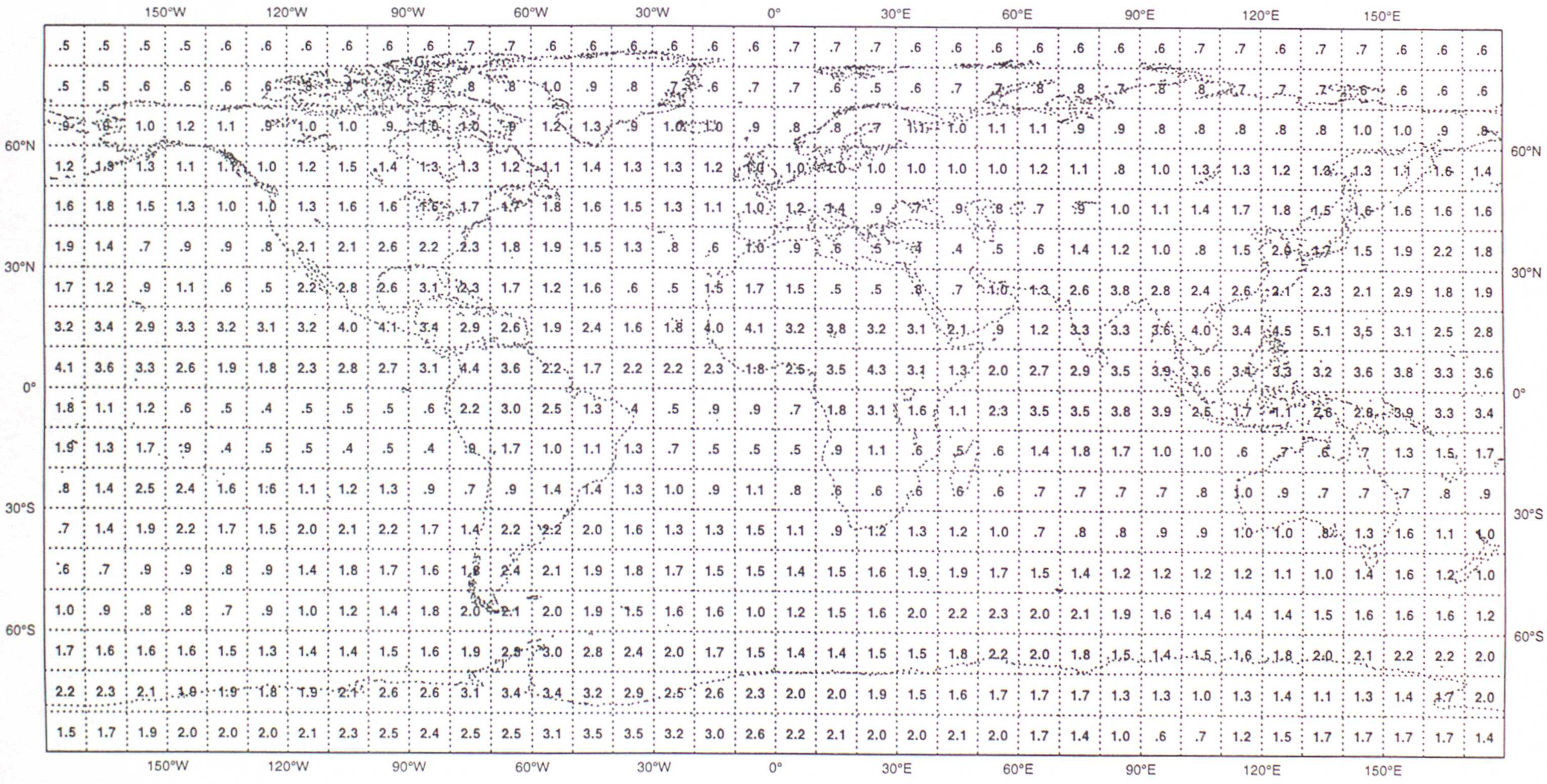

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .6 .7 .7 .7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .7 .7 .6 .6 .6
.5 .5 .6 .6 .6 .6 .8 .8 .7 .8 .8 .8 1.0 .9 .8 .7 .6 .7 .7 .6 .5 .6 .7 .7 .8 .8 .7 .8 .8 .7 .7 .7 .6 .6 .6 .6
.9 .8 1.0 1.2 1.1 .9 1.0 1.0 .9 1.0 1.0 .9 1.2 1.3 .9 1.0 1.0 .9 .8 .8 .7 1.1 1.0 1.1 1.1 .9 .9 .8 .8 .8 .8 .8 1.0 1.0 .9 .8
1.2 1.3 1.3 1.1 1.1 1.0 1.2 1.5 1.4 1.3 1.3 1.2 1.1 1.4 1.3 1.3 1.2 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.2 1.1 .8 1.0 1.3 1.3 1.2 1.3 1.3 1.1 1.6 1.4
1.6 1.8 1.5 1.3 1.0 1.0 1.3 1.6 1.6 1.6 1.7 1.7 1.8 1.6 1.5 1.3 1.1 1.0 1.2 1.4 .9 .7 .9 .8 .7 .9 1.0 1.1 1.4 1.7 1.8 1.5 1.6 1.6 1.6 1.6
1.9 1.4 .7 .9 .9 .8 2.1 2.1 2.6 2.2 2.3 1.8 1.9 1.5 1.3 .8 .6 1.0 .9 .6 .5 .4 .4 .5 .6 1.4 1.2 1.0 .8 1.5 2.0 1.7 1.5 1.9 2.2 1.8
1.7 1.2 .9 1.1 .6 .5 2.2 2.8 2.6 3.1 2.3 1.7 1.2 1.6 .6 .5 1.5 1.7 1.5 .5 .5 .8 .7 1.0 1.3 2.6 3.8 2.8 2.4 2.6 2.1 2.3 2.1 2.9 1.8 1.9
3.2 3.4 2.9 3.3 3.2 3.1 3.2 4.0 4.1 3.4 2.9 2.6 1.9 2.4 1.6 1.8 4.0 4.1 3.2 3.8 3.2 3.1 2.1 .9 1.2 3.3 3.3 3.6 4.0 3.4 4.5 5.1 3.5 3.1 2.5 2.8
4.1 3.6 3.3 2.6 1.9 1.8 2.3 2.8 2.7 3.1 4.4 3.6 2.2 1.7 2.2 2.2 2.3 1.8 2.5 3.5 4.3 3.1 1.3 2.0 2.7 2.9 3.5 3.9 3.6 3.4 3.3 3.2 3.6 3.8 3.3 3.6
1.8 1.1 1.2 .6 .5 .4 .5 .5 .5 .6 2.2 3.0 2.5 1.3 .4 .5 .9 .9 .7 1.8 3.1 1.6 1.1 2.3 3.5 3.5 3.8 3.9 2.5 1.7 1.1 2.6 2.8 3.9 3.3 3.4
1.9 1.3 1.7 .9 .4 .5 .5 .4 .5 .4 .8 1.7 1.0 1.1 1.3 .7 .5 .5 .5 .9 1.1 .6 .5 .6 1.4 1.8 1.7 1.0 1.0 .6 .7 .6 .7 1.3 1.5 1.7
.8 1.4 2.5 2.4 1.6 1.6 1.1 1.2 1.3 .9 .7 .9 1.4 1.4 1.3 1.0 .9 1.1 .8 .6 .6 .6 .6 .6 .7 .7 .7 .7 .8 1.0 .9 .7 .7 .7 .8 .9
.7 1.4 1.9 2.2 1.7 1.5 2.0 2.1 2.2 1.7 1.4 2.2 2.2 2.0 1.6 1.3 1.3 1.5 1.1 .9 1.2 1.3 1.2 1.0 .7 .8 .8 .9 .9 1.0 1.0 .8 1.3 1.6 1.1 1.0
.6 .7 .9 .9 .8 .9 1.4 1.8 1.7 1.6 1.8 2.4 2.1 1.9 1.8 1.7 1.5 1.5 1.4 1.5 1.6 1.9 1.9 1.7 1.5 1.4 1.2 1.2 1.2 1.2 1.1 1.0 1.4 1.6 1.2 1.0
1.0 .9 .8 .8 .7 .9 1.0 1.2 1.4 1.8 2.0 2.1 2.0 1.9 1.5 1.6 1.6 1.0 1.2 1.5 1.6 2.0 2.2 2.3 2.0 2.1 1.9 1.6 1.4 1.4 1.4 1.5 1.6 1.6 1.6 1.2
1.7 1.6 1.6 1.6 1.5 1.3 1.4 1.4 1.5 1.6 1.9 2.5 3.0 2.8 2.4 2.0 1.7 1.5 1.4 1.4 1.5 1.5 1.8 2.2 2.0 1.8 1.5 1.4 1.5 1.6 1.8 2.0 2.1 2.2 2.2 2.0
2.2 2.3 2.1 1.8 1.9 1.8 1.9 2.1 2.6 2.6 3.1 3.4 3.4 3.2 2.9 2.5 2.6 2.3 2.0 2.0 1.9 1.5 1.6 1.7 1.7 1.7 1.3 1.3 1.0 1.3 1.4 1.1 1.3 1.4 1.7 2.0
1.5 1.7 1.9 2.0 2.0 2.0 2.1 2.3 2.5 2.4 2.5 2.5 3.1 3.5 3.5 3.2 3.0 2.6 2.2 2.1 2.0 2.0 2.1 2.0 1.7 1.4 1.0 .6 .7 1.2 1.5 1.7 1.7 1.7 1.7 1.4

Figure 64. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-5 (700 hPa)
NOAA17, using all observations

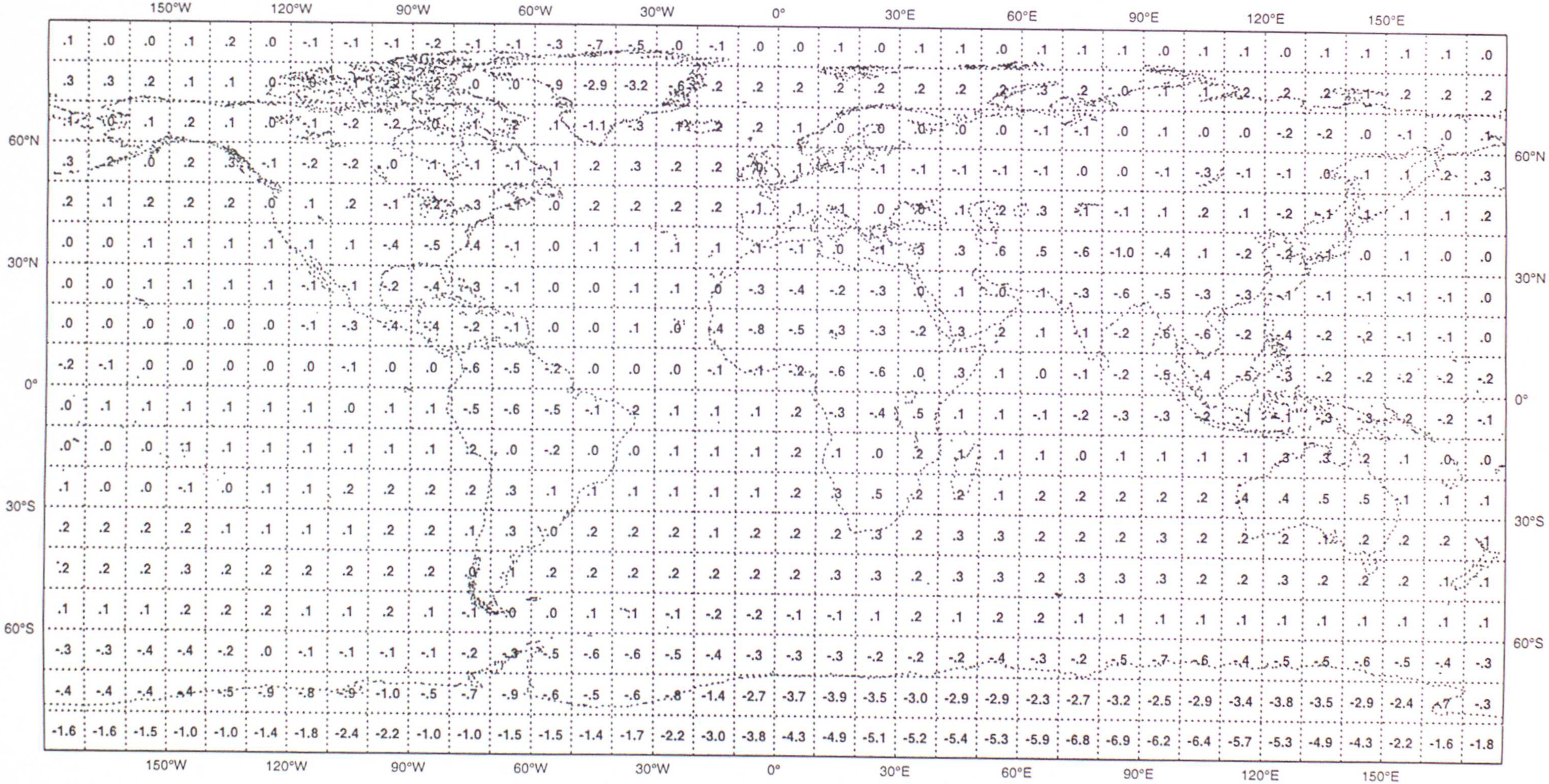

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.1 .0 .0 .1 .2 .0 -.1 -.1 -.1 -.2 -.1 -.1 -.3 -.7 -.5 .0 -.1 .0 .0 .1 .0 .1 .1 .0 .1 .1 .1 .0 .1 .1 .0 .1 .1 .1 .1 .0
.3 .3 .2 .1 .1 .0 .0 .1 .2 .2 .0 .0 -.9 -2.9 -3.2 -.6 .2 .2 .2 .2 .2 .2 .2 .2 .3 .2 .0 .1 .1 .2 .2 .2 .1 .2 .2 .2
.1 .0 .1 .2 .1 .0 -.1 -.2 -.2 .0 .1 .2 .1 -1.1 -.3 .1 .2 .2 .1 .0 .0 .0 .0 .0 -.1 -.1 .0 .1 .0 .0 -.2 -.2 .0 -.1 .0 .1
.3 .2 .0 .2 .3 -.1 -.2 -.2 .0 .1 -.1 -.1 .1 .2 .3 .2 .2 .0 .1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 -.1 -.3 -.1 -.1 .0 .1 .1 .2 .3
.2 .1 .2 .2 .2 .0 .1 .2 -.1 .2 -.3 -.1 .0 .2 .2 .2 .2 .1 .1 -.1 .0 .0 .1 .2 .3 -.1 -.1 .1 .2 .1 -.2 -.1 .1 .1 .1 .2
.0 .0 .1 .1 .1 .1 .1 .1 -.4 -.5 .4 -.1 .0 .1 .1 .1 .1 .1 -.1 .0 -.1 .3 .3 .6 .5 -.6 -1.0 -.4 .1 -.2 -.2 -.1 .0 .1 .0 .0
.0 .0 .1 .1 .1 .1 -.1 -.1 -.2 -.4 -.3 -.1 .0 .0 .1 .1 .0 -.3 -.4 -.2 -.3 .0 .1 .0 .1 -.3 -.6 -.5 -.3 -.3 -.1 -.1 -.1 -.1 -.1 .0
.0 .0 .0 .0 .0 .0 -.1 -.3 -.4 -.4 -.2 -.1 .0 .0 .1 .0 .4 -.8 -.5 -.3 -.3 -.2 .3 .2 .1 -.1 -.2 -.6 -.6 -.2 -.4 -.2 -.2 -.1 -.1 .0
-.2 -.1 .0 .0 .0 .0 .0 -.1 .0 .0 -.6 -.5 -.2 .0 .0 .0 -.1 -.1 -.2 -.6 -.6 .0 .3 .1 .0 -.1 -.2 -.5 -.4 -.5 -.3 -.2 -.2 -.2 -.2 -.2
.0 .1 .1 .1 .1 .1 .1 .0 .1 .1 -.5 -.6 -.5 -.1 .2 .1 .1 .1 .2 -.3 -.4 .5 .1 .1 -.1 -.2 -.3 -.3 -.2 -.1 -.1 -.3 -.3 -.2 -.2 -.1
.0 .0 .0 .1 .1 .1 .1 .1 .1 .1 .2 .0 -.2 .0 .0 .1 .1 .1 .2 .1 .0 .2 .1 .1 .1 .0 .1 .1 .1 .1 .3 .3 .2 .1 .0 .0
.1 .0 .0 -.1 .0 .1 .1 .2 .2 .2 .2 .3 .1 .1 .1 .1 .1 .1 .2 .3 .5 .2 .2 .1 .2 .2 .2 .2 .2 .4 .4 .5 .5 .1 .1 .1
.2 .2 .2 .2 .1 .1 .1 .1 .2 .2 .1 .3 .0 .2 .2 .2 .1 .2 .2 .2 .3 .2 .3 .3 .2 .2 .2 .3 .2 .2 .2 .1 .2 .2 .2 .1
.2 .2 .2 .3 .2 .2 .2 .2 .2 .2 .0 .1 .2 .2 .2 .2 .2 .2 .2 .3 .3 .2 .3 .3 .2 .3 .3 .3 .2 .2 .3 .2 .2 .2 .1 .1
.1 .1 .1 .2 .2 .2 .1 .1 .2 .1 -.1 .0 .0 .1 .1 -.1 -.2 -.2 -.1 -.1 .1 .2 .1 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1
-.3 -.3 -.4 -.4 -.2 .0 -.1 -.1 -.1 -.1 -.2 -.3 -.5 -.6 -.6 -.5 -.4 -.3 -.3 -.3 -.2 -.2 -.2 -.4 -.3 -.2 -.5 -.7 -.6 -.4 -.5 -.5 -.6 -.5 -.4 -.3
-.4 -.4 -.4 -.4 -.5 -.9 -.8 -.9 -1.0 -.5 -.7 -.9 -.6 -.5 -.6 -.8 -1.4 -2.7 -3.7 -3.9 -3.5 -3.0 -2.9 -2.9 -2.3 -2.7 -3.2 -2.5 -2.9 -3.4 -3.8 -3.5 -2.9 -2.4 -.7 -.3
-1.6 -1.6 -1.5 -1.0 -1.0 -1.4 -1.8 -2.4 -2.2 -1.0 -1.0 -1.5 -1.5 -1.4 -1.7 -2.2 -3.0 -3.8 -4.3 -4.9 -5.1 -5.2 -5.4 -5.3 -5.9 -6.8 -6.9 -6.2 -6.4 -5.7 -5.3 -4.9 -4.3 -2.2 -1.6 -1.8

Figure 65. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-5 (700 hPa)
NOAA17, using all observations

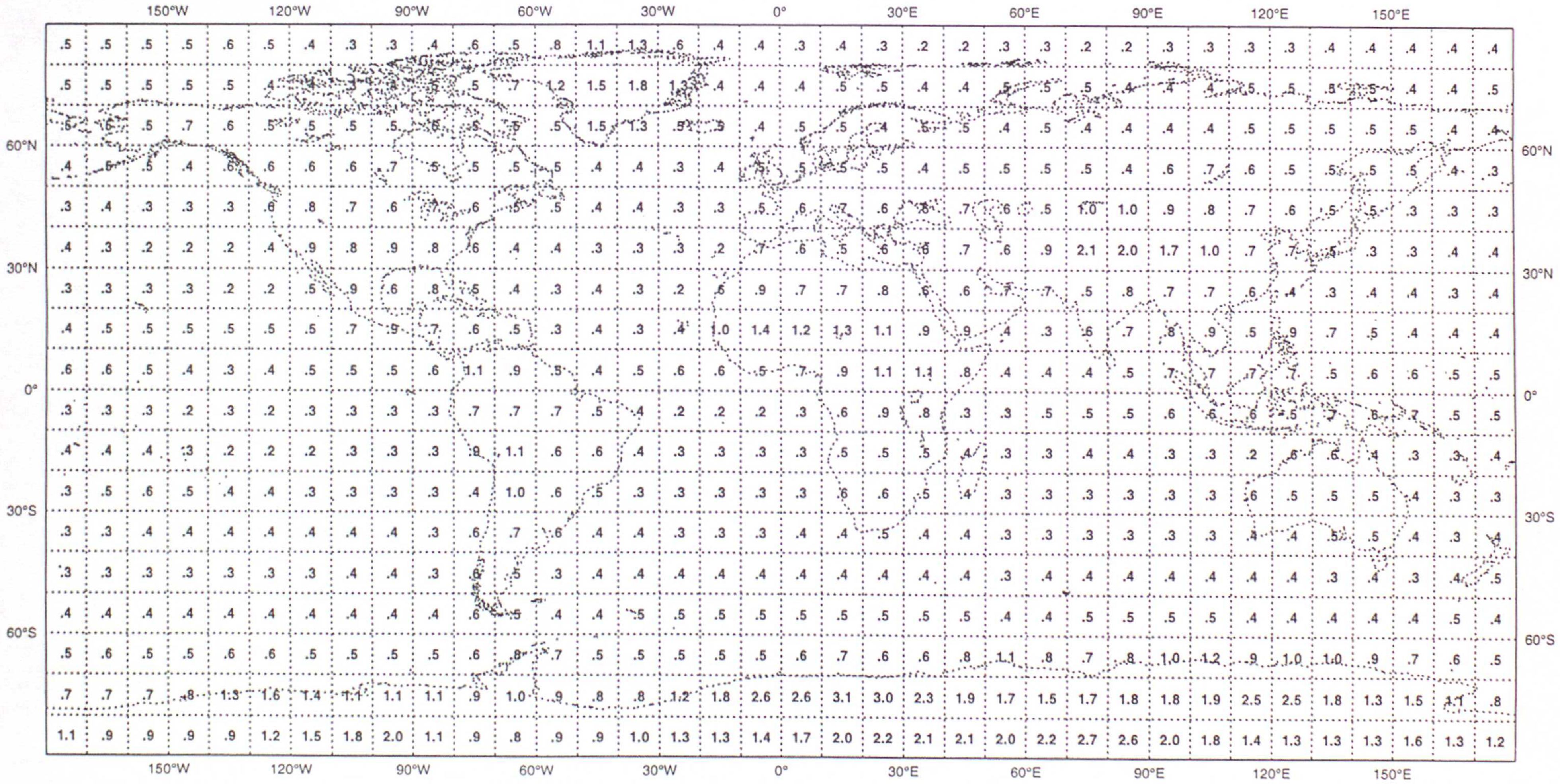

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .6 .5 .4 .3 .3 .4 .6 .5 .8 1.1 1.3 .6 .4 .4 .3 .4 .3 .2 .2 .3 .3 .2 .2 .3 .3 .3 .3 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .4 .4 .3 .4 .5 .5 .7 1.2 1.5 1.8 1.3 .4 .4 .4 .5 .5 .4 .4 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .4 .4 .5
.5 .6 .5 .7 .6 .5 .5 .5 .5 .6 .5 .5 .5 1.5 1.3 .5 .5 .4 .5 .5 .4 .5 .5 .4 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4
.4 .5 .5 .4 .6 .6 .6 .6 .7 .5 .5 .5 .5 .4 .4 .3 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .6 .7 .6 .5 .5 .5 .5 .4 .3
.3 .4 .3 .3 .3 .6 .8 .7 .6 .7 .6 .5 .5 .4 .4 .3 .3 .5 .6 .7 .6 .8 .7 .6 .5 1.0 1.0 .9 .8 .7 .6 .5 .5 .3 .3 .3
.4 .3 .2 .2 .2 .4 .9 .8 .9 .8 .6 .4 .4 .3 .3 .3 .2 .7 .6 .5 .6 .6 .7 .6 .9 2.1 2.0 1.7 1.0 .7 .7 .5 .3 .3 .4 .4
.3 .3 .3 .3 .2 .2 .5 .9 .6 .8 .5 .4 .3 .4 .3 .2 .6 .9 .7 .7 .8 .6 .6 .7 .7 .5 .8 .7 .7 .6 .4 .3 .4 .4 .3 .4
.4 .5 .5 .5 .5 .5 .5 .7 .9 .7 .6 .5 .3 .4 .3 .4 1.0 1.4 1.2 1.3 1.1 .9 .9 .4 .3 .6 .7 .8 .9 .5 .9 .7 .5 .4 .4 .4
.6 .6 .5 .4 .3 .4 .5 .5 .5 .6 1.1 .9 .5 .4 .5 .6 .6 .5 .7 .9 1.1 1.1 .8 .4 .4 .4 .5 .7 .7 .7 .7 .5 .6 .6 .5 .5
.3 .3 .3 .2 .3 .2 .3 .3 .3 .3 .7 .7 .7 .5 .4 .2 .2 .2 .3 .6 .9 .8 .3 .3 .5 .5 .5 .6 .6 .6 .5 .7 .6 .7 .5 .5
.4 .4 .4 .3 .2 .2 .2 .3 .3 .3 .9 1.1 .6 .6 .4 .3 .3 .3 .3 .5 .5 .5 .4 .3 .3 .4 .4 .3 .3 .2 .6 .6 .4 .3 .3 .4
.3 .5 .6 .5 .4 .4 .3 .3 .3 .3 .4 1.0 .6 .5 .3 .3 .3 .3 .3 .6 .6 .5 .4 .3 .3 .3 .3 .3 .3 .6 .5 .5 .5 .4 .3 .3
.3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .6 .7 .6 .4 .4 .3 .3 .3 .4 .4 .5 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .5 .5 .4 .3 .4
.3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .6 .5 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .4 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .5 .4
.5 .6 .5 .5 .6 .6 .5 .5 .5 .5 .6 .8 .7 .5 .5 .5 .5 .5 .6 .7 .6 .6 .8 1.1 .8 .7 .8 1.0 1.2 .9 1.0 1.0 .9 .7 .6 .5
.7 .7 .7 .8 1.3 1.6 1.4 1.1 1.1 1.1 .9 1.0 .9 .8 .8 1.2 1.8 2.6 2.6 3.1 3.0 2.3 1.9 1.7 1.5 1.7 1.8 1.8 1.9 2.5 2.5 1.8 1.3 1.5 1.1 .8
1.1 .9 .9 .9 .9 1.2 1.5 1.8 2.0 1.1 .9 .8 .9 .9 1.0 1.3 1.3 1.4 1.7 2.0 2.2 2.1 2.1 2.0 2.2 2.7 2.6 2.0 1.8 1.4 1.3 1.3 1.3 1.6 1.3 1.2

Figure 66. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-7 (300 hPa)
NOAA17, using all observations

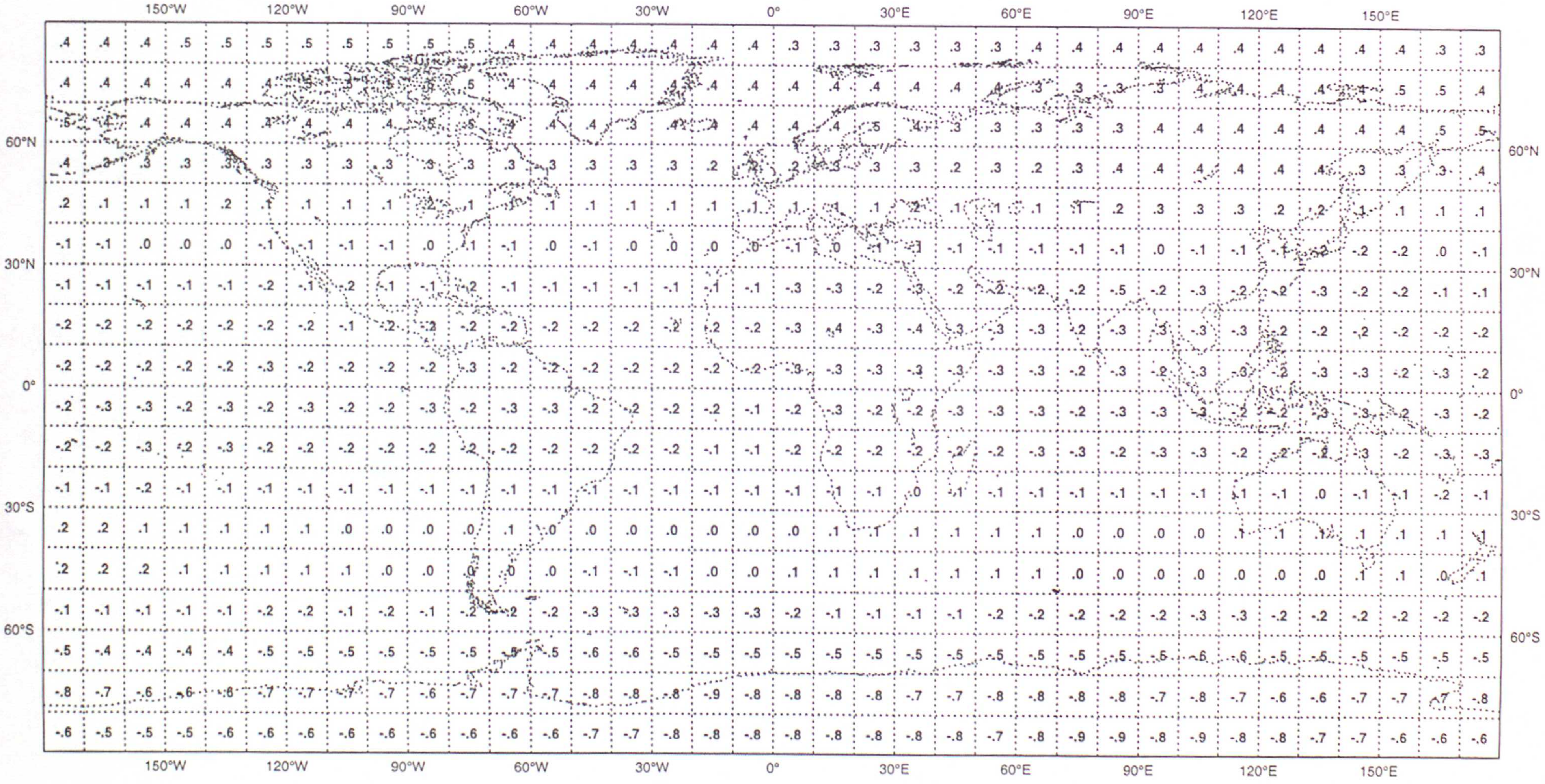

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.4 .4 .4 .4 .4 .4 .5 .3 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .5 .5 .4
.5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .3 .4 .4 .4 .4 .4 .5 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .5 .5
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .3 .3 .3 .2 .3 .2 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4
.2 .1 .1 .1 .2 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .2 .3 .3 .3 .2 .2 .1 .1 .1 .1
-.1 -.1 .0 .0 .0 -.1 -.1 -.1 -.1 .0 -.1 -.1 .0 -.1 .0 .0 .0 .0 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.2 -.2 -.2 .0 -.1
-.1 -.1 -.1 -.1 -.1 -.2 -.1 -.2 -.1 -.1 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.3 -.3 -.2 -.3 -.2 -.2 -.2 -.2 -.5 -.2 -.3 -.2 -.2 -.3 -.2 -.2 -.1 -.1
-.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.4 -.3 -.4 -.3 -.3 -.3 -.2 -.3 -.3 -.3 -.3 -.2 -.2 -.2 -.2 -.2 -.2
-.2 -.2 -.2 -.2 -.2 -.3 -.2 -.2 -.2 -.2 -.3 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.2 -.3 -.2 -.3 -.3 -.2 -.3 -.3 -.2 -.3 -.2
-.2 -.3 -.3 -.2 -.3 -.2 -.3 -.2 -.2 -.3 -.2 -.3 -.3 -.2 -.2 -.2 -.2 -.1 -.2 -.3 -.2 -.2 -.3 -.3 -.3 -.2 -.3 -.3 -.3 -.2 -.2 -.3 -.3 -.2 -.3 -.2
-.2 -.2 -.3 -.2 -.3 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.2 -.3 -.3 -.2 -.2 -.2 -.3 -.2 -.3 -.3
-.1 -.1 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.2 -.1
.2 .2 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .0 .0 .0 .0 .0 .0 .0 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .1 .1 .1 .1 .1 .1
.2 .2 .2 .1 .1 .1 .1 .1 .0 .0 .0 .0 .0 -.1 -.1 -.1 .0 .0 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 .0 .1 .1 .0 .1
-.1 -.1 -.1 -.1 -.1 -.2 -.2 -.1 -.2 -.1 -.2 -.2 -.2 -.3 -.3 -.3 -.3 -.3 -.2 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.2 -.2 -.2 -.2 -.2 -.2
-.5 -.4 -.4 -.4 -.4 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.6 -.6 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.6 -.6 -.6 -.5 -.5 -.5 -.5 -.5 -.5
-.8 -.7 -.6 -.6 -.6 -.7 -.7 -.7 -.7 -.6 -.7 -.7 -.7 -.8 -.8 -.8 -.9 -.8 -.8 -.8 -.8 -.7 -.7 -.8 -.8 -.8 -.8 -.7 -.8 -.7 -.6 -.6 -.7 -.7 -.7 -.8
-.6 -.5 -.5 -.5 -.6 -.6 -.6 -.6 -.6 -.6 -.6 -.6 -.6 -.7 -.7 -.8 -.8 -.8 -.8 -.8 -.8 -.8 -.8 -.7 -.8 -.9 -.9 -.8 -.9 -.8 -.8 -.7 -.7 -.6 -.6 -.6

Figure 67. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-7 (300 hPa)
NOAA17, using all observations

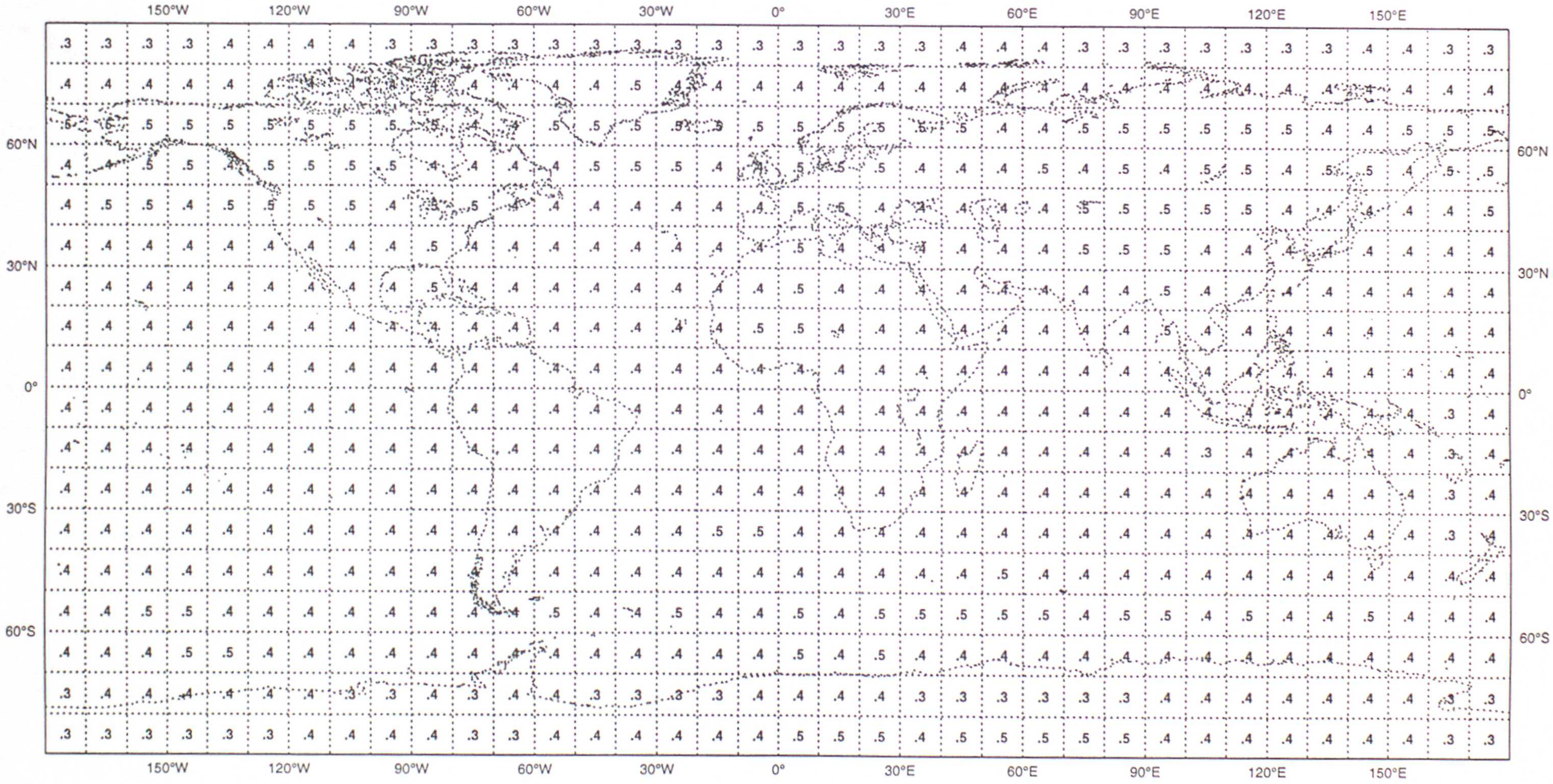

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 68. ATOVS MEAN O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-9 (100 hPa)
NOAA17, using all observations

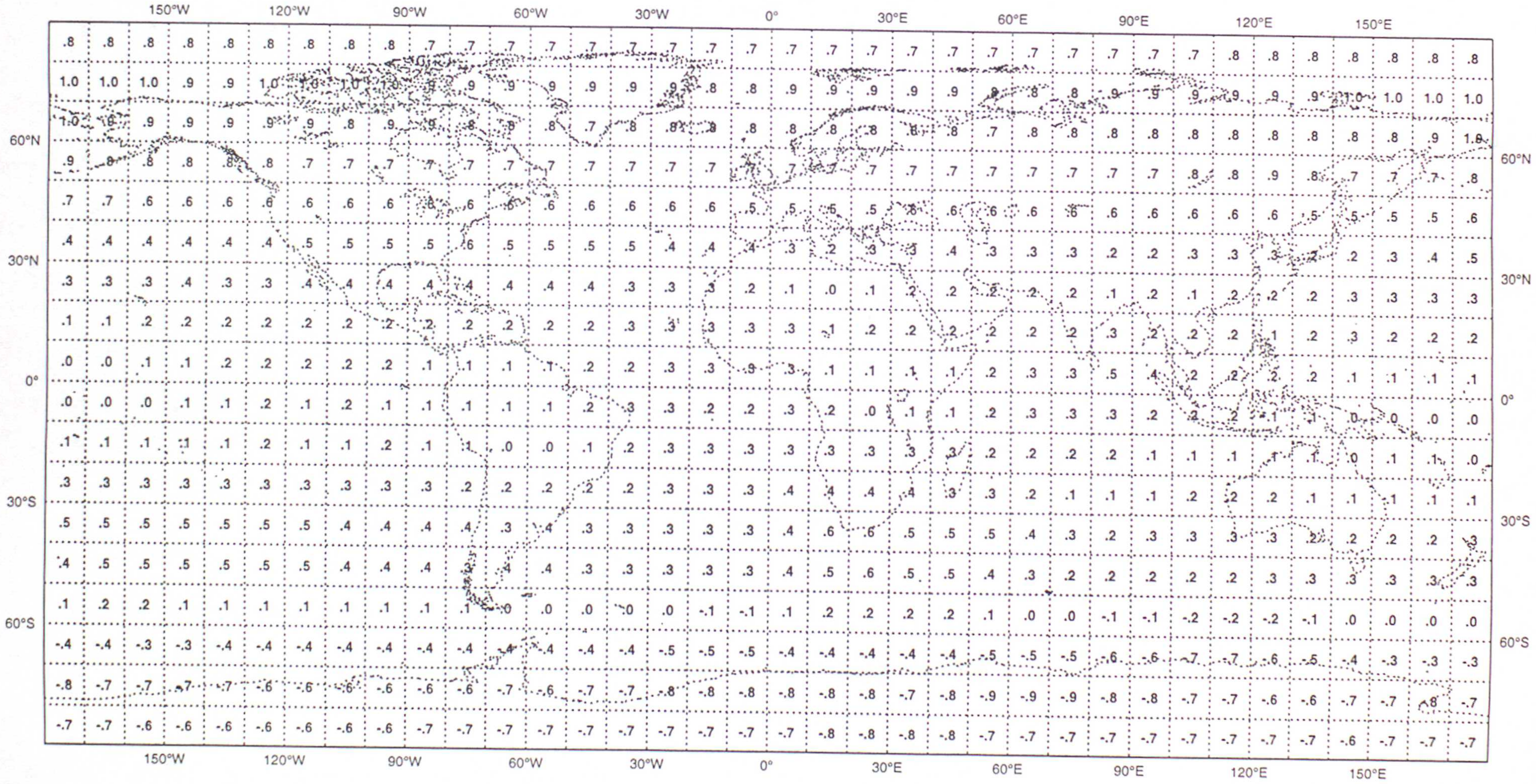
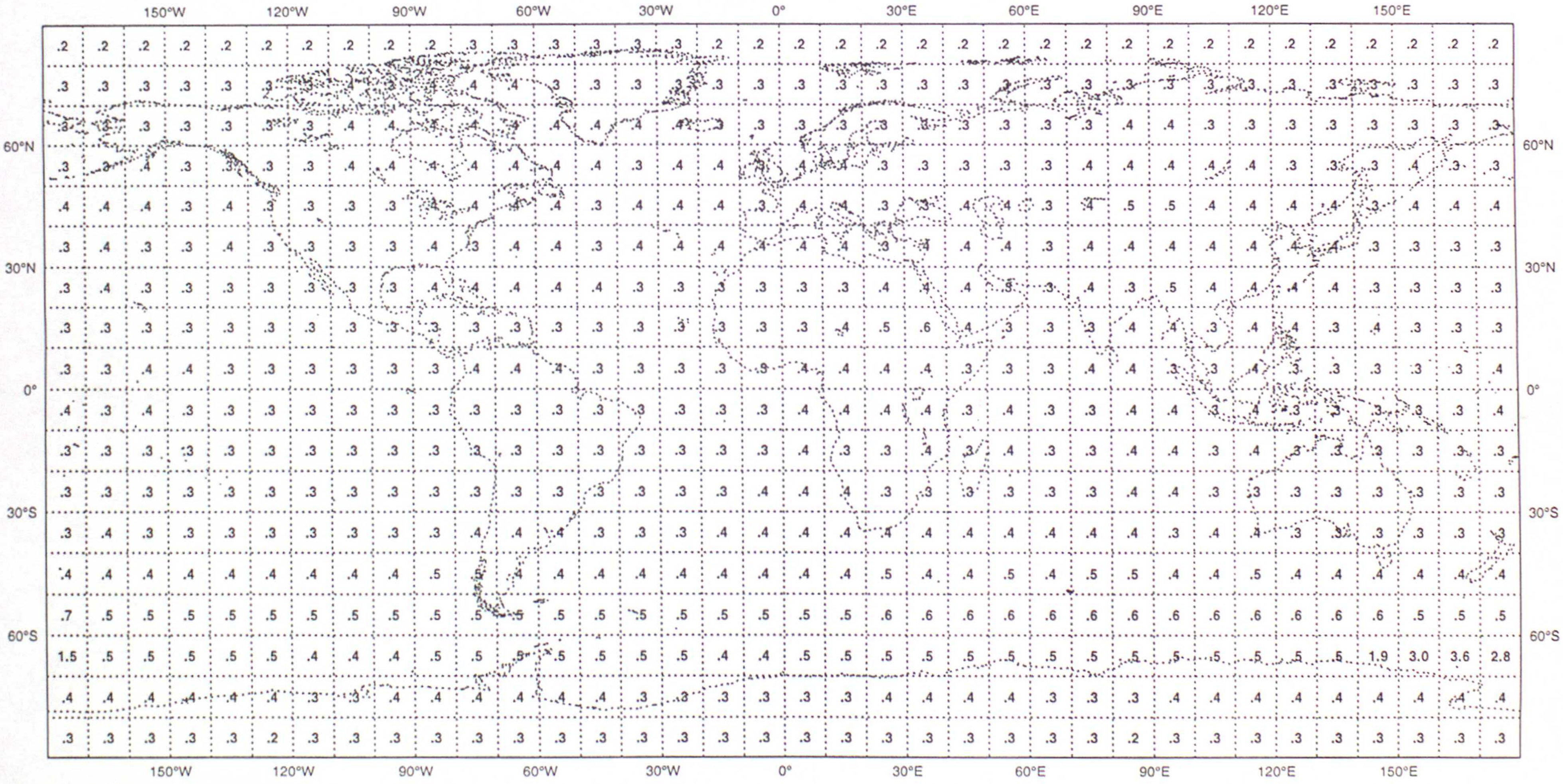

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 69. ATOVS SD O-B brightness temperature differences (deg C). AUGUST 2003
Channel: AMSUA-9 (100 hPa)
NOAA17, using all observations



.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.4	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.3	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.4	.3	.3
.4	.4	.4	.3	.4	.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.4	.4	.3	.4	.4	.3	.3	.4	.4	.3	.4	.5	.5	.4	.4	.4	.4	.3	.4	.4	.4
.3	.4	.3	.3	.4	.3	.3	.3	.3	.4	.3	.4	.4	.3	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3
.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.5	.3	.4	.3	.5	.4	.4	.4	.4	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.5	.6	.4	.3	.3	.3	.4	.4	.3	.4	.4	.3	.4	.3	.3	.3
.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.4	.3	.3	.4	.3	.3	.3	.3	.3	.4
.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.3	.3	.4	.4	.3	.4	.3	.3	.3	.3	.3	.4
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.4	.3	.4	.3	.3	.4	.4	.3	.4	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3
.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.3	.3	.3	.3	.3	.3
.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.5	.5	.4	.4	.5	.4	.4	.4	.4	.4	.4
.7	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5
1.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	1.9	3.0	3.6	2.8
.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4
.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13599	18.1	-33.5	P	550	0	0	0.5	0.1	0.5
13600	16.9	-26.2	P	770	0	29	0.6	0.0	0.6
13602	18.8	-30.0	P	517	0	0	0.5	0.0	0.5
13604	14.5	-26.1	P	506	0	0	0.6	0.2	0.6
41502	12.2	-63.2	P	730	0	66	0.7	0.9	1.1
41503	23.8	-71.2	P	746	0	30	0.5	-2.1	2.2
41504	10.2	-55.1	P	729	0	66	0.8	0.6	1.0
41505	16.1	-53.0	P	512	0	100	0.5	-9.4	9.5
41521	16.0	-48.1	P	750	0	67	0.6	-2.9	3.0
41522	21.9	-57.5	P	605	0	0	0.6	-2.0	2.1
41532	24.1	-70.1	P	616	0	0	0.5	1.1	1.2
41534	27.5	-61.2	P	623	0	1	0.5	0.5	0.7
41537	28.5	-59.3	P	621	0	0	0.6	1.0	1.2
41630	30.5	-77.5	P	532	0	0	0.6	1.2	1.3
41631	26.6	-73.4	P	523	0	0	0.6	0.8	1.0
41645	25.8	-74.6	P	576	0	0	0.5	1.3	1.4
41646	21.7	-70.6	P	523	0	0	0.5	0.6	0.8
41647	20.5	-69.7	P	552	0	0	0.5	0.8	1.0
41649	16.3	-61.1	P	80	0	100	0.3	-5.5	5.5
41655	25.6	-74.7	P	549	0	0	0.5	1.0	1.1
41658	43.4	-18.9	P	416	0	0	0.5	-1.3	1.4
41659	30.0	-38.8	P	645	0	0	0.4	-0.1	0.4
41666	33.3	-47.9	P	642	0	0	0.5	0.7	0.9
44551	42.3	-51.6	P	566	0	1	0.6	0.4	0.8
44585	41.8	-69.3	P	477	0	33	0.5	1.4	1.5
44603	56.7	-28.8	P	807	0	20	0.5	0.0	0.5
44605	52.9	-42.3	P	1059	0	38	0.6	-0.2	0.7
44606	37.1	-54.6	P	675	0	1	0.5	0.1	0.5
44608	35.5	-35.2	P	671	0	1	0.6	-0.2	0.6
44609	56.0	-16.2	P	640	0	1	0.6	-0.5	0.8
44610	42.3	-32.8	P	220	0	38	0.7	-0.3	0.8
44611	57.4	-23.6	P	657	0	2	1.1	-0.2	1.2
44613	54.5	-23.6	P	613	0	0	0.6	-0.7	0.9
44614	56.3	-44.7	P	1105	0	43	0.6	-0.4	0.7
44615	44.8	-33.8	P	809	0	22	0.5	-0.4	0.7
44620	42.4	-23.8	P	1094	0	41	0.6	0.0	0.6
44621	58.8	-36.0	P	628	0	1	0.5	0.1	0.5
44622	49.9	-25.1	P	627	0	1	0.6	-0.2	0.6
44623	38.3	-48.8	P	668	0	1	0.5	0.0	0.6
44626	39.2	-71.9	P	673	0	1	0.6	0.7	0.9
44628	39.4	-38.6	P	660	0	1	0.5	-0.6	0.8
44630	36.9	-60.8	P	672	0	1	0.6	0.8	1.0
44723	40.2	-20.0	P	641	0	1	0.4	-0.2	0.5
44726	65.4	-56.6	P	1516	0	55	0.7	0.1	0.7
44730	56.7	-28.2	P	1306	0	48	0.5	-0.5	0.6
44741	39.0	-69.9	P	294	32	36	2.4	1.3	2.7
44744	51.0	-46.2	P	225	0	2	0.6	0.2	0.6
44764	59.3	-16.4	P	1808	0	64	0.7	-0.4	0.8
44767	63.7	-4.1	P	644	0	1	0.5	-0.4	0.6
44774	39.8	-11.6	P	248	0	13	0.5	-0.2	0.6
44776	52.4	-11.8	P	350	0	31	1.9	0.4	2.0
44777	39.9	-21.4	P	323	0	14	0.4	-0.1	0.4
44778	40.4	-29.8	P	331	0	20	0.5	0.2	0.5
44779	53.8	-21.2	P	410	0	31	0.6	0.1	0.6
44780	56.3	-50.6	P	676	0	42	0.6	-0.1	0.6
47554	72.6	-74.9	P	81	0	25	1.0	0.0	1.0
62513	34.7	-19.3	P	658	0	1	0.4	0.3	0.5
62514	32.1	-22.9	P	643	0	1	0.5	0.0	0.5
62515	19.4	-44.9	P	678	0	1	0.6	0.3	0.7
62517	27.6	-29.2	P	670	0	1	0.4	-0.5	0.7

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62519        46.7   -3.9    P       874    0   29    0.5    -0.7    0.9
62551        43.9  -25.6    P       649    0    2    0.6     0.0    0.6
62552        35.8  -21.6    P       661    0    1    0.4     0.3    0.6
62553        37.0  -18.4    P       660    0    0    0.4     0.1    0.4
62554        41.2  -19.7    P       656    0    3    1.1     0.2    1.1

62599        62.8   -5.0    P       731    0   47    0.5     0.1    0.5
62600        52.2   -5.9    P       461    0   32    0.4     0.0    0.4
62711        48.0  -45.5    P       631    0    1    0.7     0.1    0.7
62712        54.3  -41.6    P       769    0   15    0.6    -0.1    0.6
62801        39.9  -21.9    P       928    0   37    0.5     0.6    0.7

62802        37.6  -20.1    P       651    0    1    0.4    -0.3    0.5
62803        44.4  -11.9    P       681    0   10    1.1    -0.4    1.1
62804        47.2   -9.0    P       653    0    1    0.6    -0.8    1.0
64523        60.2  -31.1    P       227    0    2    0.4    -0.1    0.4
758140       33.2  -71.5    P         1    0    0    0.0     0.8    0.8


IDENTIFIER   LAT.  LONG.  ELEM    NOBS  PGE  %REJ   SD    BIAS    RMS

13599        18.1  -33.5  SPEED   537    0  100    1.0    -1.5    1.8
13600        16.9  -26.2  SPEED   767    0  100    1.2    -0.4    1.3
13602        18.8  -30.0  SPEED   501    0  100    1.1    -0.7    1.3
13604        14.5  -26.1  SPEED   495    0  100    1.3    -0.3    1.4
41522        21.9  -57.5  SPEED   601    0  100    1.6    -0.1    1.6

41532        24.1  -70.1  SPEED     2    0  100    0.6     2.4    2.5
41534        27.5  -61.2  SPEED   619    0  100    1.2    -1.2    1.7
41537        28.5  -59.3  SPEED   392    0  100    1.8    -0.5    1.8
41630        30.5  -77.5  SPEED   467    0  100    1.5    -0.4    1.6
41631        26.6  -73.4  SPEED   410    0  100    1.8    -0.2    1.8

41645        25.8  -74.6  SPEED   555    0  100    1.5    -0.7    1.6
41646        21.7  -70.6  SPEED   508    0  100    1.4    -0.7    1.5
41647        20.5  -69.7  SPEED   495    0  100    1.8    -0.1    1.8
41655        25.6  -74.7  SPEED   533    0  100    1.8    -0.1    1.8
44551        42.3  -51.6  SPEED   490    0  100    2.3     0.4    2.3

44615        44.8  -33.8  SPEED   803    0  100    2.0     1.1    2.3
44620        42.4  -23.8  SPEED  1087    0  100    2.0    -0.2    2.0
62711        48.0  -45.5  SPEED   629    0  100    3.2     2.7    4.2
758140       33.2  -71.5  SPEED     1    0  100    0.0     3.1    3.1

IDENTIFIER   LAT.  LONG.  ELEM    NOBS  PGE  %REJ   SD    BIAS    RMS

13599        18.1  -33.5  DIRN.   308    0    0   15.7   -27.7   31.8
13600        16.9  -26.2  DIRN.   345    0    0   14.7    21.0   25.6
13602        18.8  -30.0  DIRN.   324    0    0   12.1    36.0   38.0
13604        14.5  -26.1  DIRN.   101    0    0   18.2    -3.8   18.6
41522        21.9  -57.5  DIRN.   402    0    0   16.8    -6.8   18.1

41532        24.1  -70.1  DIRN.     2    0    0    9.1   -87.8   88.2
41534        27.5  -61.2  DIRN.   201    0    0   10.7     2.6   11.0
41537        28.5  -59.3  DIRN.   182    1    0   10.3   -38.2   39.5
41630        30.5  -77.5  DIRN.   213    0    0   24.5     1.6   24.6
41631        26.6  -73.4  DIRN.   242    0    0   17.0     1.3   17.1

41645        25.8  -74.6  DIRN.   341    0    0   19.6    23.6   30.7
41646        21.7  -70.6  DIRN.   464    0    0   25.7    11.2   28.0
41647        20.5  -69.7  DIRN.   446    0    0   20.4     8.6   22.1
41655        25.6  -74.7  DIRN.   343    0    0   18.3     2.4   18.5
44551        42.3  -51.6  DIRN.   278    0    0   34.6   -10.8   36.2

44615        44.8  -33.8  DIRN.   442    0    0   20.1     5.1   20.8
44620        42.4  -23.8  DIRN.   708    0    0   14.0   -12.9   19.0
62711        48.0  -45.5  DIRN.   444    0    0   22.7    -3.0   22.9
758140       33.2  -71.5  DIRN.     1    0    0    0.0    -5.0    5.0
```

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	565	2	10	1.7	0.3	495	0	8	0	7.1	0.1
ACA	1667	1	3	1.6	-0.1	1581	0	3	0	7.3	0.4
AEA	127	1	6	1.5	0.6	70	0	7	0	8.0	0.4
AEL	400	2	10	1.7	-0.2	356	0	9	0	6.9	0.5
AEW	79	3	10	2.2	-0.5	79	0	9	0	9.9	1.0
AFL	363	1	2	1.6	0.2	361	1	5	0	8.7	0.1
AFR	767	0	4	1.5	0.2	702	0	5	0	8.1	0.3
AIS	178	1	12	2.0	-0.4	171	0	17	0	11.0	0.1
AJM	283	0	4	1.7	-0.3	258	0	2	0	6.6	0.8
AMM	105	0	0	1.3	0.4	95	0	5	0	9.4	-0.2
AMX	162	1	5	1.6	0.2	133	1	7	0	8.3	0.2
AZA	419	0	3	1.6	-0.4	408	0	5	0	8.9	0.3
BAF	25	0	8	2.1	0.1	24	0	8	0	5.6	0.5
BAL	110	0	11	1.6	0.2	109	0	10	0	8.1	0.6
BAW	474	1	7	1.9	-0.6	464	1	8	0	7.2	0.4
BHP	25	0	12	2.4	-1.2	22	0	9	0	7.0	-0.1
BPA	189	1	9	1.3	0.1	171	0	10	0	7.2	-1.0
BSK	26	0	0	1.7	-0.5	28	0	11	0	9.7	-2.4
BWA	75	0	4	1.8	0.3	62	0	0	0	5.5	1.0
CFC	50	0	14	1.3	-0.5	48	0	17	0	5.9	-0.4
CFG	375	0	4	1.5	-0.2	361	0	4	0	7.1	0.3
CKS	136	24	33	2.3	0.9	134	1	11	0	8.4	0.3
CLX	172	0	1	1.6	-0.2	154	0	3	0	8.1	0.1
COA	72	0	32	1.5	0.0	52	0	40	0	7.5	2.2
CRL	278	1	3	1.6	0.2	239	0	5	0	10.5	0.8
CUB	104	0	5	2.1	-0.2	88	1	3	0	6.1	1.2
DAL	1228	0	5	1.5	-0.5	1152	0	5	0	7.3	0.7
DBR	29	0	7	2.2	-0.5	35	0	11	0	11.2	-0.3
DCE	152	0	13	1.3	-0.5	144	0	14	0	8.2	-0.4
DHL	107	6	100	6.4	-6.2	104	0	100	0	18.2	3.8
DLH	702	0	10	1.5	0.0	698	0	11	0	7.2	0.5
EDW	64	0	2	1.6	-0.3	64	0	0	0	5.0	0.7
EEZ	76	1	8	1.7	-0.2	71	0	6	0	5.0	0.8
EIA	299	1	14	1.8	1.0	289	0	100	0	21.5	6.8
ELY	304	1	4	1.6	0.2	304	0	4	0	7.9	-0.1
ETH	21	0	5	1.2	0.5	21	0	5	0	6.8	1.1
FDX	677	0	28	1.2	0.1	688	0	30	0	8.6	0.4
FIN	310	0	3	1.7	0.1	277	0	5	0	8.0	0.2
GAF	51	0	8	2.3	-1.0	43	2	5	0	4.9	0.8
GCO	255	0	4	1.4	0.3	255	0	100	0	7.9	0.9
GRL	110	1	2	1.5	0.0	91	0	0	0	3.8	0.2
GTI	235	2	15	2.2	0.6	229	0	12	0	8.2	-0.3
HLN	58	2	7	1.7	-1.0	52	0	6	0	9.6	0.1
IBE	806	0	8	1.7	0.2	624	0	10	0	8.1	0.1
ICE	791	1	3	1.6	-0.2	768	1	3	0	6.6	0.6
IWD	56	2	4	1.2	0.0	20	0	0	0	5.1	0.0
KLM	930	0	3	1.6	0.1	872	0	4	0	6.8	0.3
LDI	370	0	4	1.4	-0.4	317	0	4	0	8.9	0.1
LOT	141	0	4	1.8	-1.1	127	1	6	0	6.5	0.6
LTU	625	0	4	1.4	-0.2	540	0	6	0	7.3	0.5
LXR	52	2	15	2.0	0.1	47	0	17	0	12.3	2.4
MAS	25	0	4	2.2	-0.8	24	0	0	0	5.1	1.5
MON	58	0	0	1.1	-0.1	56	0	0	0	4.8	0.4
MPD	105	0	10	2.9	1.4	70	0	4	0	8.7	-0.7
MPH	447	0	3	1.8	-1.1	415	0	5	0	7.6	0.0
MYT	205	0	3	1.4	-0.2	195	0	2	0	5.8	0.0
NCA	26	0	0	1.2	0.2	22	0	0	0	5.4	-1.0
NWA	3116	1	3	1.8	0.2	3076	0	3	0	7.2	0.2
OAE	92	0	5	1.3	-0.5	91	0	31	0	16.8	4.1

TEMPERATURE WIND

IDENT. N.REP. PG PR RMS BIAS N.REP. PG PR PC RMS BIAS

OOM	158	0	10	2.2	1.5	140	0	9	0	5.7	-0.1
PAC	291	0	7	1.9	-0.1	287	0	9	0	8.8	-0.3
RAM	226	1	3	1.7	0.2	176	0	100	0	7.8	0.9
RCH	234	0	20	2.9	-0.1	211	0	100	0	9.8	1.2
RRR	110	1	9	1.8	0.1	105	0	11	0	9.8	0.0
RZO	284	0	1	1.3	-0.5	248	0	3	0	7.7	0.4
SEU	64	0	5	1.9	0.0	62	0	5	0	9.1	1.2
SLR	157	1	10	1.4	0.0	157	0	10	0	7.2	-0.1
SVA	29	0	0	1.6	0.3	28	4	11	0	10.8	0.0
TAP	203	1	3	1.3	-0.4	139	0	6	0	9.4	0.2
TPA	25	0	0	1.1	0.1	24	0	0	0	3.8	-0.3
TSC	220	0	2	1.7	-0.2	202	0	3	0	8.2	0.4
UAL	240	0	44	1.8	-0.7	234	0	49	0	9.0	0.6
UPS	1096	1	49	1.5	0.1	1049	0	50	0	7.6	0.3
VIR	252	0	2	1.4	-0.1	252	0	6	0	8.7	0.4
VPB	22	0	0	1.7	0.0	20	0	0	0	6.3	1.4
WOA	231	0	6	1.7	0.5	215	0	6	0	7.5	0.6

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	24453	0	15	1.3	0.2	24453	0	15	0	4.6	0.4
KL	361	0	4	1.3	0.7	357	0	4	0	5.9	0.7
TN	32	3	25	2.9	1.0	33	0	18	0	7.4	0.0

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	365	0	7	2.5	0.8	362	0	4	0	7.8	0.8
US ACARS	18243	5	39	1.4	0.2	18243	0	30	0	5.1	0.4

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	100	1	0	0.0	10.0	-10.0
DBBH	00	Z	100	19	0	13.5	23.4	19.1
DBBH	12	Z	100	22	0	7.8	15.2	13.0
DBLK	12	Z	100	11	0	10.5	34.4	32.7
EBUQ	12	Z	100	16	0	13.3	17.2	-10.9
ELML7	00	Z	100	21	0	14.7	14.9	-2.8
ELML7	12	Z	100	18	0	16.6	17.9	-6.8
FQFL	00	Z	100	7	0	11.7	22.2	-18.9
FQFL	12	Z	100	7	0	29.2	42.4	-30.7
KHRH	00	Z	100	2	1	120.5	148.3	-86.5
KHRH	12	Z	100	4	1	65.0	109.2	-87.8
KRPD	00	Z	100	3	2	1.2	11.4	11.3
KRPD	12	Z	100	8	0	7.3	17.0	15.4
LDWR	00	Z	100	27	0	8.4	11.3	7.6
LDWR	12	Z	100	28	0	13.2	13.5	-2.9
OXVH2	00	Z	100	5	0	16.7	18.1	7.0
OXVH2	12	Z	100	7	0	49.1	50.1	-10.0
OXYH2	00	Z	100	2	0	5.5	12.7	11.5
OXYH2	12	Z	100	4	1	6.3	16.5	15.3
V2XM	00	Z	100	5	0	6.6	17.1	15.8
V2XM	12	Z	100	4	0	18.2	24.9	17.0
WPKD	00	Z	100	5	0	11.3	11.5	-2.4
WPKD	12	Z	100	4	0	106.9	125.7	-66.3
ZCBP6	00	Z	100	1	0	0.0	8.0	8.0
03953	00	Z	100	27	0	9.2	17.0	14.2
03953	12	Z	100	29	0	11.8	13.8	7.2
04018	00	Z	100	26	0	7.8	18.1	16.3
04018	12	Z	100	29	0	15.0	18.8	11.4
04220	00	Z	100	26	0	9.8	17.6	14.6
04220	12	Z	100	28	0	11.4	18.8	15.0
04270	00	Z	100	26	0	8.3	17.7	15.6
04270	12	Z	100	26	0	12.1	19.8	15.7
04339	00	Z	100	27	0	8.8	17.6	15.2
04339	12	Z	100	27	0	7.6	15.6	13.6
04360	00	Z	100	27	0	10.2	19.1	16.2
04360	12	Z	100	26	0	6.9	18.9	17.6
08001	00	Z	100	22	0	21.5	25.6	-14.0
08001	12	Z	100	22	0	21.2	26.4	-15.7
08508	12	Z	100	28	0	9.1	12.1	7.9
08522	12	Z	100	24	0	13.7	21.2	16.2
08594	12	Z	100	21	0	17.1	17.1	-0.2
71600	00	Z	100	27	0	9.3	9.7	2.7
71600	12	Z	100	29	0	13.4	13.9	-3.5
72201	00	Z	100	27	0	11.2	18.9	15.3
72201	12	Z	100	28	0	11.7	29.6	27.2
72402	00	Z	100	27	0	12.6	31.6	29.0
72402	12	Z	100	28	0	17.5	48.7	45.4
74494	00	Z	100	25	0	10.9	13.5	8.0
74494	12	Z	100	28	0	11.2	13.7	-7.9
78016	00	Z	100	27	0	15.3	24.0	18.5
78016	12	Z	100	28	0	23.8	33.3	23.3

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	500	1	0	0.0	13.0	-13.0
DBBH	00	Z	500	20	0	8.8	13.3	10.0
DBBH	12	Z	500	23	0	7.8	8.4	3.0
DBLK	12	Z	500	11	0	5.2	6.3	3.5
EBUQ	12	Z	500	16	0	12.9	17.4	-11.6
ELML7	00	Z	500	21	0	12.1	23.1	-19.7
ELML7	12	Z	500	18	0	8.8	15.7	-13.1
FQFL	00	Z	500	7	0	20.7	25.4	-14.7
FQFL	12	Z	500	9	0	10.6	11.1	-3.1
KHRH	00	Z	500	1	2	0.0	12.0	12.0
KHRH	12	Z	500	3	2	54.2	79.2	-57.7
KRPD	00	Z	500	3	2	7.1	7.4	2.0
KRPD	12	Z	500	8	0	7.2	7.6	2.5
LDWR	00	Z	500	27	0	6.3	6.4	-0.4
LDWR	12	Z	500	28	0	8.0	8.5	-2.9
OXVH2	00	Z	500	5	0	7.7	10.1	6.6
OXVH2	12	Z	500	7	0	24.1	24.9	-6.4
OXYH2	00	Z	500	2	0	7.5	7.9	2.5
OXYH2	12	Z	500	4	1	1.8	5.8	5.5
V2XM	00	Z	500	5	0	10.0	13.5	9.0
V2XM	12	Z	500	7	0	12.4	14.3	7.3
WPKD	00	Z	500	5	0	4.8	10.8	-9.6
WPKD	12	Z	500	4	0	55.8	65.2	-33.8
ZCBP6	00	Z	500	1	0	0.0	18.0	18.0
03953	00	Z	500	27	0	5.7	6.6	3.4
03953	12	Z	500	29	0	5.2	5.5	1.8
04018	00	Z	500	27	0	9.6	13.5	9.5
04018	12	Z	500	29	0	9.0	11.7	7.4
04220	00	Z	500	26	0	9.2	16.0	13.0
04220	12	Z	500	29	0	8.7	12.4	8.9
04270	00	Z	500	27	0	9.7	14.0	10.2
04270	12	Z	500	27	0	9.8	13.6	9.5
04339	00	Z	500	27	0	8.5	14.1	11.3
04339	12	Z	500	27	0	8.9	12.9	9.4
04360	00	Z	500	27	0	8.5	13.7	10.7
04360	12	Z	500	26	0	7.2	13.3	11.2
08001	00	Z	500	24	0	12.7	15.3	-8.5
08001	12	Z	500	25	0	9.1	13.1	-9.4
08508	12	Z	500	28	0	7.2	7.2	-0.3
08522	12	Z	500	24	0	6.5	6.5	0.5
08594	12	Z	500	24	0	7.2	9.8	-6.7
71600	00	Z	500	27	0	5.6	6.2	-2.7
71600	12	Z	500	29	0	8.4	8.4	-0.5
72201	00	Z	500	27	0	6.7	6.9	-1.8
72201	12	Z	500	28	0	5.6	5.9	-1.7
72402	00	Z	500	27	0	6.8	6.8	0.0
72402	12	Z	500	28	0	7.0	8.0	4.0
74494	00	Z	500	26	0	9.3	9.9	-3.5
74494	12	Z	500	29	0	8.9	8.9	-0.7
78016	00	Z	500	27	0	10.2	15.0	11.0
78016	12	Z	500	29	0	14.0	20.8	15.4

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO	OBS			NUM	NUM	%			
IDENT	TIME	ELM	LEV	OBS	GROSS	REJ	RMS	UBIAS	VBIAS
DASAP3	12	V	100	1	0	0	4.3	0.2	-4.3
DBBH	00	V	100	18	0	0	4.0	-0.4	0.7
DBBH	12	V	100	22	0	0	3.0	0.1	0.7
DBLK	12	V	100	10	1	0	2.5	0.0	-0.6
EBUQ	12	V	100	16	0	0	4.6	-0.5	1.5
ELML7	00	V	100	18	0	0	3.9	-0.8	0.3
ELML7	12	V	100	16	0	0	3.8	-0.9	-0.2
FQFL	00	V	100	7	0	0	5.2	0.1	2.2
FQFL	12	V	100	7	0	0	4.2	-0.4	0.1
KHRH	00	V	100	3	0	0	4.1	2.6	-2.3
KHRH	12	V	100	3	0	0	2.5	-0.3	-0.5
KRPD	00	V	100	5	0	0	3.1	0.0	1.5
KRPD	12	V	100	6	0	0	6.5	3.1	2.2
LDWR	00	V	100	27	0	0	2.0	0.0	-0.4
LDWR	12	V	100	28	0	0	2.0	-0.4	0.0
OXVH2	00	V	100	5	0	0	8.8	-0.2	-4.6
OXVH2	12	V	100	7	0	0	2.7	-0.7	0.1
OXYH2	12	V	100	3	0	0	6.6	-1.8	-0.3
V2XM	00	V	100	3	0	0	2.3	0.8	-0.3
V2XM	12	V	100	4	0	0	3.0	-0.7	-0.6
WPKD	00	V	100	4	0	0	8.5	4.5	1.0
WPKD	12	V	100	1	0	0	7.1	-4.5	5.5
ZCBP6	00	V	100	1	0	0	3.1	2.3	2.1
03953	00	V	100	27	0	0	2.7	0.4	0.5
03953	12	V	100	29	0	0	2.3	0.7	-0.1
04018	00	V	100	26	0	0	2.7	0.3	-0.3
04018	12	V	100	29	0	0	1.7	0.3	-0.3
04220	00	V	100	26	0	0	2.5	-0.3	0.0
04220	12	V	100	28	0	0	2.3	0.1	0.6
04270	00	V	100	26	0	0	3.4	-1.0	-0.5
04270	12	V	100	26	0	0	3.0	-0.7	0.0
04339	00	V	100	20	0	0	3.8	-0.1	0.0
04339	12	V	100	26	0	0	4.3	0.7	0.5
04360	00	V	100	27	0	0	3.5	0.1	1.3
04360	12	V	100	26	0	0	2.1	0.2	0.0
08001	00	V	100	21	0	0	3.8	0.5	0.4
08001	12	V	100	21	0	0	3.1	0.4	-0.2
08508	12	V	100	8	0	0	3.5	-1.2	1.5
08522	12	V	100	24	0	0	4.8	0.9	0.9
08594	12	V	100	19	0	100	3.6	0.1	-0.5
71600	00	V	100	27	0	0	2.8	-0.2	-0.4
71600	12	V	100	29	0	0	2.7	-0.1	0.3
72201	00	V	100	27	0	0	3.1	0.8	-0.1
72201	12	V	100	28	0	0	2.8	-0.2	-0.8
72402	00	V	100	27	0	0	3.7	0.9	-0.4
72402	12	V	100	28	0	0	3.4	-1.1	-0.9
74494	00	V	100	25	0	100	2.4	0.6	-0.4
74494	12	V	100	28	0	100	3.3	-0.2	0.4
78016	00	V	100	27	0	0	4.6	-2.0	-0.3
78016	12	V	100	28	0	0	3.6	1.1	0.0

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Aug 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP3	12	V	500	1	0	0	3.8	1.3	-3.6
DBBH	00	V	500	18	0	0	3.4	0.5	0.2
DBBH	12	V	500	23	0	0	3.3	0.4	0.4
DBLK	12	V	500	11	0	0	3.2	1.7	-0.5
EBUQ	12	V	500	16	0	0	5.3	0.2	-2.5
ELML7	00	V	500	17	0	0	3.3	1.1	0.3
ELML7	12	V	500	17	0	0	2.9	-0.3	0.6
FQFL	00	V	500	7	0	0	4.6	0.7	1.6
FQFL	12	V	500	9	0	0	4.6	-1.0	0.8
KHRH	00	V	500	3	0	0	4.6	2.4	-3.1
KHRH	12	V	500	4	0	0	2.3	1.7	-0.7
KRPD	00	V	500	5	0	0	3.0	-1.5	-0.2
KRPD	12	V	500	7	0	0	2.8	-0.9	-0.3
LDWR	00	V	500	27	0	0	2.9	-0.2	-0.3
LDWR	12	V	500	28	0	0	3.6	0.5	-0.2
OXVH2	00	V	500	5	0	20	24.5	0.9	-12.5
OXVH2	12	V	500	7	0	0	3.3	-0.7	-0.4
OXYH2	12	V	500	4	0	0	9.8	4.7	2.9
V2XM	00	V	500	5	0	0	5.1	2.6	-1.5
V2XM	12	V	500	7	0	0	2.4	-0.7	0.6
WPKD	00	V	500	3	0	0	2.5	-0.8	-0.2
WPKD	12	V	500	1	0	0	3.6	0.8	3.5
ZCBP6	00	V	500	1	0	0	0.3	0.3	-0.1
03953	00	V	500	27	0	0	3.5	0.1	-0.1
03953	12	V	500	29	0	0	2.9	0.8	-0.1
04018	00	V	500	27	0	0	3.8	0.6	-0.7
04018	12	V	500	29	0	0	3.4	-0.9	-0.4
04220	00	V	500	26	0	0	3.8	0.1	0.2
04220	12	V	500	29	0	0	3.3	-0.5	0.0
04270	00	V	500	27	0	0	4.5	0.1	-0.9
04270	12	V	500	27	0	0	4.2	0.9	-0.7
04339	00	V	500	23	0	0	5.3	0.4	0.3
04339	12	V	500	27	0	0	4.4	0.7	0.3
04360	00	V	500	27	0	0	3.7	0.6	0.0
04360	12	V	500	26	0	0	3.5	-0.1	0.3
08001	00	V	500	23	0	0	4.4	1.2	-0.4
08001	12	V	500	25	0	0	2.6	-0.9	0.3
08508	12	V	500	9	0	0	3.5	-0.5	0.7
08522	12	V	500	24	0	0	3.4	-0.5	-0.2
08594	12	V	500	24	0	100	4.5	0.2	-1.9
71600	00	V	500	27	0	0	3.5	1.0	0.3
71600	12	V	500	29	0	0	3.0	1.6	-0.2
72201	00	V	500	27	0	0	2.6	0.0	-0.4
72201	12	V	500	28	0	0	2.8	0.1	-0.5
72402	00	V	500	27	0	0	2.6	-0.1	-0.3
72402	12	V	500	28	0	0	2.9	0.5	0.5
74494	00	V	500	26	0	100	3.1	-0.4	0.3
74494	12	V	500	29	0	100	2.9	0.2	0.6
78016	00	V	500	27	0	0	3.3	0.0	-0.3
78016	12	V	500	29	0	0	3.4	0.6	0.5

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45